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WELCOME TO ICENS 2018

On behalf of the organizing committee, we are pleased to announce that the 4rd International Conference on Engineering and Natural Sciences (ICENS 2018) will be held from May 2 to 6, 2018 in Kiev, Ukraine. ICENS 2018 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.

The scientific program will focus 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 goal will 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,

Prof. Dr.Özer ÇINAR

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Synthesis And Characterization Of Au Nanoparticle By Laser Ablation Technique

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AN ELECTROELASTIC PROBLEM OF GREEN MATERIALS SUBJECTED TO SURFACE TORQUE

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Abstract:

With the aim of understanding the responses to the mechanical inputs that the green materials such as wood and poly-L-lactic acid undergo, and of developing the nondestructive evaluation techniques for these materials, we approach the subject in a mesoscopic viewpoint in which wood and poly-L-lactic acid are regarded as bodied with D∞ symmetry, and theoretically study the electroelastic field in such a body subjected to a surface torque. First, the constitutive equations are derived considering the microstructures and their combined behaviors. Then, the displacement and electric field are expressed in terms of two types of displacement potential functions and the electric potential function. Their governing equations are obtained using the fundamental equations for the electroelastic field. As a result, the field quantities are found to be expressed in terms of the general solutions of two elastic displacement potential functions and two piezoelastic displacement potential functions, each of which satisfies a Laplace equation with respect to the appropriately transformed spatial coordinates. By use of thus-constructed analytical technique, the electroelastic field in a semi-infinite body subjected to a surface torque is analyzed, and the solutions of the field quantities are obtained in the Fourier integral forms. Then, the solutions are evaluated numerically by performing the integrations, and the necessities to conduct the electroelastic analysis are clearly illustrated.

Keywords: Green Material, Electroelasticity, D∞ Symmetry, Theoretical Analysis

**This study was supported by JSPS KAKENHI Grant Number 15K05685.*

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SYNTHESIS AND CHARACTERIZATION OF STA CONTAINED HETEROGENEOUS CATALYSTS BY DIRECT- HYDROTHERMAL METHOD

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Abstract:

Silica-based mesoporous support materials are widely utilized in the synthesis of heterogeneous catalysts. Recently, the direct-hydrothermal technique has been used for obtained heterogeneous catalysts. The aim of the present study is to obtain silicotungstic acid (STA) anchored STA/MCM-48 solid-state catalysts via direct-hydrothermal synthesis method. MCM-48 is a member of the M41S family with a cubic structure and 3D(three-dimensional) pore system. In the present study, firstly, MCM-48 was synthesized by direct-hydrothermal synthesis method using Cetyltrimethylammonium bromide(CTMABr) and Tetraethylorthosilicate(TEOS). Secondly, catalyst property was provided by adding STA ($H_4SiW_{12}O_{40}$) to the support material. The active compound(STA) was loaded with silicon source the during synthesis. The loading content of STA was determined between 5-40% (W/Si:%) based on the weight ratio of W (tungsten) in the active compound(STA) and Si (Silicon) in the TEOS. Finally, the synthesized catalysts and support material were characterized by TG/DTA(Thermogravimetry-differential), FT-IR (Fourier transform infrared-spectroscopy), DRIFT(Multiple internal reflection), XRD(X-ray diffraction), SEM(Scanning electron microscope), MAPPING and BET(Brunauer-Emmett-Teller) analysis methods. Moreover, the effects of STA loading on the physical properties of the catalysts were investigated. Especially, according to results of XRD and BET analyses, the direct-hydrothermal method was successfully applied in the synthesis of heterogeneous catalysts containing STA as the active compound.

Keywords: MCM-48, Direct- Hydrothermal Synthesis, STA(H4siw12o40)

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CATALYTIC ACTIVITY AND SUSTAINABILITY INVESTIGATION OF STA/MCM-41, STA/SBA-15 ACIDIC CATALYSTS AND ION-EXCHANGE RESINS IN ESTERIFICATION REACTION

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Abstract:

MCM-41 and SBA-15 support materials functionalized with Silicotungstic acid (STA) have been shown as efficient solid acidic catalysts for methanol/acetic acid esterification (methyl acetate) reaction. The purpose of this study is the investigation of the catalytic activities and the sustainability of synthesized and ion-exchange catalysts in liquid phase reaction. In the present work, the hydrothermal method was applied for the synthesis of STA/MCM-41 (molar ratio; W/Si:10%) and STA/SBA-15 (molar ratio; W/Si:10%) catalysts. MCM-41, SBA-15 and Silicotungstic acid (STA) were used as silica sources and active material, respectively. The STA was loaded by dry-impregnation method after silica source (Sodium silicate (Na2SiO3) and Tetraethylorthosilicate; (TEOS)). The catalytic activities of STA/MCM-41, STA/SBA-15 catalysts and ion- exchange resins (Amberlyst-35 and Amberlyst IR 120) were investigated with methyl acetate reactions. Second reaction experiments of all catalysts were also conducted under the identical conditions in the presence of catalysts recovered after first esterification reactions. After second reactions, the sustainable activities of STA/MCM-41 and STA/SBA-15 could be achieved for 24h analysis (24h: 23, 35%, respectively). Characterization studies of the obtained catalysts were determined by BET, XRD, SEM - MAPPING and DRIFT, analysis methods.

Keywords: MCM-41, SBA-15, STA, Catalytic Activity-Sustainability, Amberlyst-35, Amberlyst IR 120

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DESIGN OF A ROBOTIC PNEUMATIC PRUNER FOR ROBOTIC APPLE HARVESTING

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Abstract:

The robotic systems firstly developed in industrial production domain. But, in countries, in which the number of agricultural workers is limited and the costs are high, there is a tendency towards robotic technology in agricultural production. For this reason, the robotic system implementations started to seem in many agricultural activities. In the present study, the robotic system was discussed in terms of harvesting that is one of the agricultural activities. The robotic harvesting system consists of image processor, robotic arm, and gripper, which performs the final action. In this study, the position of fruit was determined in real-time by using the image processing. The X- and Y-coordinates sent to robotic arm directed the movement of it. Z-axis, which is the third axis and provides the forwards movement, was controlled using distance sensor. The designed pneumatic pruner system was mounted at the tip of robotic arm. The experiments were carried out on 100 Golden apples at different locations on the branch. Based on the coordinates of fruit, 85% positioning accuracy and 73% success rate were obtained in cutting the fruit from branch. The cutting success was statistically analyzed. At the end of study, the position of fruit stem corresponding to the tip of pruner, the position of pruner corresponding to the body of fruit, the fruit, or the beginning of stem rather than the stem itself, and the position of pruner on the shoot of stem were observed to cause failure during cutting procedure. According to the results obtained from experiments, it was concluded that the system to be used in such systems is the pneumatic pruner system.

Keywords: Robotic,Harvesting,Apple

[*]This study is supported by Scientific Activities Support Program of NAMIK KEMAL University"

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A MODEL MATLAB APPLICATION FOR ROBOTIC KIWI HARVESTING

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Abstract:

Robotic Systems are developing extensively in our age. Robotic systems are utilized in agriculture industry just as all other scientific fields and industries. Robotic systems are employed in company with image processing method particularly in accurate agriculture and continuing to develop further. Most of the studies are experimental. Possible problems are tried to be detected and solved by prototype studies. The fundamental concept of this study is image processing. Therefore, numerous methods and software are used for image processing. MATLAB's Image Processing Toolbox program, modeling program with Simulink, and the Smart programs of utilized cameras can be hold up as examples. There are variations within these methods in terms of application and outcomes. A model implementation with MATLAB's Image Processing Toolbox is carried out in our study for robotic harvest. The image retrieved from the camera by the system is processed. The problem observed during the task and the respective solution are described.

Keywords: Matlab,Image Processing,Robotics System,Harvesting

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PROVIDED ANTIMICROBIAL PROPERTIES AND DYEING OF ORGANIC COTTON PRODUCTS WITH NATURAL DYES (MADDER AND GALL OAK)

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Abstract:

Nowadays, with the increase in the time spent in public places, the spread of microorganisms has accelerated and has become a serious threat to public health. This situation has led researchers to the development of natural antimicrobial agents and natural dyes. During the investigation, dye plants have been used as antimicrobial agents and dye agents. The fabrics, which had different percent of mordant, were mordanted a constant temperature of 65°C for 2 hours. After the mordanting process, organic cotton fabrics were dyed with different concentrations of madder (Rubia tinctorum L.) and gall oak (Quercus infectoria Olivier) extract. Each dyed fabrics were analyzed by RP-HPLC-DAD. Semi-quantities of coloring compounds and antimicrobial agents were determined in the dyed fabrics, depending on the amounts of madder and gall oak. To determine the antimicrobial activity, AATCC 100 standard was used for un-dyed fabric and dyed fabrics. Staphyloccocus aureus (Gram positive) and Escherichia coli (Gram negative) were used as test bacteria for both samples. The color coordinates of the dyed organic cotton fabrics were measured, and the rubbing, wash and light fastness properties of the dyed materials were determined and are discussed. According to the analysis results, organic cotton fabrics were dyed with madder and gall oak natural dye sources. Wash fastness, light fastness and rub fastness of the cotton samples were tested according to ISO 105-C06 (A1S), ISO 105- B02, ISI 105- X12 and ISI 105-E04. According to the test results, natural dye sources can be used on the cotton productions. Madder and gall oak were determined as an antibacterial agent and dye coloring material. For this reason, sustainability and awareness can be creating with natural dyes in the mass productions.

Keywords: Antimicrobial, Natural Dyes, Organic Cotton, Fastness

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FARMERS' RISK PERCEPTION AND STRATEGIES TO COPING WITH RISK IN STRAWBERRY PRODUCTION: A CASE STUDY FROM TURKEY

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Abstract:

Empirical studies on strawberry farmers' risk perceptions and management strategies have still received little attention in agricultural research of developing countries. The main purpose of this study was to determine and analyze farmers' risk perceptions and risk management strategies in strawberry production based on a case study was conducted in Mersin placed in Mediterranean region where obtaining most part (approximately 70 %) of strawberry production in Turkey. We used primary data collected from 54 strawberry farmers in May and October 2017. The primary data incorporated both cross-sectional farmer data and key informant discussion. The data were collected from the three villages of Silifke where place in Mersin province which obtained the highest strawberry production of Turkey. Factor analysis was used in data reduction to identify a small number of factors related to risk sources and risk strategies in this study. Then, multiple regression model was used to evaluate the influence of socio-economic characteristics and information score on the strawberry farmers' risk perceptions and risk management strategies using factor loadings. The results demonstrate that international relations of Turkey and meteorological condition were perceived as the most important risks. Choosing suitable cultivar for each ecologic condition and market research were perceived as the most important strategies for managing risks. The results of factor analysis showed that the risk scale consists of 4 factors explaining 66.87% of total variance. The internal consistency coefficient Cronbach Alfa of the scale was 0.535 and KMO was 0.527. The risk management scale consists of 2 factors explaining 62.84% of total variance. The internal consistency coefficient Cronbach Alfa of the scale was 0.503 and KMO was 0.672. According to the results of regression analysis, perceptions were farmer-specific, a number of socio-economic variables and total information score were found to be related to risk and risk management.

Keywords: Risk Sources; Risk Strategies, Factor Analysis, Strawberry

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ASSESSMENT OF THE ENVIRONMENTAL ATTITUDES OF THE CITIZENS LIVING IN THE URBAN AREA OF ADANA PROVINCE, TURKEY

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Abstract:

The main purpose of this study was that to assessment of citizens' attitudes towards environment in Turkey based on a case study. The data set used in this study was collected from 320 randomly selected citizens in urban area of Adana Province. A cross sectional survey method was used in this study during the period of October and November 2017. The instrument for data collection was a structured questionnaire that consists of two sections. The first section consisted of information on sample citizens' socio-economic characteristics. The second section was "New Environmental Paradigm Scale" with Cronbach's alpha coefficient of 0.507 and It was also benefited from five-point Likert scale. It had been found that 12 statements of 15 statements in NEP scale were significant as a result of reliability evaluation. According to this result, 3 statements had been excluded from original scale. Descriptive statistics, factor analysis, and multiple regression analysis were used for the data analysis. It was found that mean environmental attitudes of citizens was 3.40 (SD: 0.56). According to this result, it can be said that citizens had favorable attitudes in issues related to environment. It was identified as a result of factor analysis that NEP scale consists of 3 components explaining 42.70% of the total variance. These factors were named as "Nature's Power", "Natural Balance" and "Ecology" according to their factor loadings, respectively. Multiple regression was used to assess the influence of citizens' socio-economic characteristics on their environmental attitudes. Three environmental attitudes indices were extracted from the corresponding factor analysis and used as dependent variables. The results showed that citizens who more educated perceived "Nature's Power" as relatively important.

Keywords: Environmental Attitudes, New Environmental Paradigm Scale, Urban Area, Turkey

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CHARACTERIZATION OF WOOD/ NANO MGO/PLASTIC NANOCOMPOSITES

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Abstract:

Effect of nano MgO on physical, mechanical and thermal properties of wood polymer nanocomposites was investigated. To meet this objective, pine wood flour, polypropylene (PP) with coupling agent (MAPP), and MgO (0, 1, 3, 5, 7 wt%) were compounded in a twin screw co-rotating extruder. The mass ratio of the wood flour to PP was 50/50 (w/w) in all compounds. Test specimens were produced using injection molding machine from the pellets. The flexural and tensile properties of the wood polymer nanocomposites decreased with increasing with content of the MgO (from 1 to 7 wt%) and MAPP (3 wt%). The mass loss rates of the wood polymer nanocomposites decreased with increasing amounts of the MAPP and MgO. The DSC analysis showed that the melt crystallization enthalpies of the wood polymer nanocomposites increased with increasing amount of the MgO. The increase in the Tc indicated that the MgO was the efficient nucleating agent for the wood polymer nanocomposites.

Keywords: Wood, Plastic, Nano, Composites, Mgo

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ECONOMIC IMPORTANCE OF WOOD BASED PANEL IN TURKEY

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Abstract:

In our country, the wood-based panel industry is about to complete the development and renovation process. New technologies and developments are successfully implemented. In this way, the contribution of the wood-based plate industry to the country's economy has increased in parallel with this renewal and development. In this study, the status of the wood based panel sector was examined between the years of 2012-2017 in Turkey. For this purpose, production quantities, import and export quantities of particleboard, medium-high density fiberboard, laminate parquet, oriented strand board, plywood and other fiber boards produced in Turkey were thoroughly evaluated. Moreover, the strengths and weaknesses (SWOT) of Turkey's wood panel industry and opportunities and threats have been analyzed. Production quantities, import and export quantity values of some wood based panel products will be obtained from the Turkish Statistical Institute (TUIK). The production quantities, import and export quantities of our country and its economic benefit will be discussed from the obtained data.

Keywords: Osb, Mdf, Plywood, Turkey

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MODELING THE WEIGHT AND LENGTH CHANGES OF THE CONCRETE EXPOSED TO SULFATE USING ARTIFICIAL NEURAL NETWORK

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Abstract:

This paper presents the modeling of an experimental investigation carried out to evaluate some mechanical and durability properties of concrete mixtures in which Turkish Class C and Class F fly ashes were partially replaced with cement. A total of 39 mixtures with different mix designs were prepared. After compressive strength testing, the mixtures containing Class F and Class C fly ashes which had similar compressive strength values to control mixtures at 28 d for each series were used for sulfate resistance tests. The degree of sulfate attack was evaluated using expansion and weight loss. The test results indicated that Class C fly ash showed higher compressive strength than Class F fly ash. Moreover, the addition of fly ash significantly increased the resistance to sulfate attack when each amount of fly ash addition regardless of fly ash types was employed. In this paper, the Artificial Neural Network (ANNs) techniques were used to model the relative change in the weight and length of the concrete exposed to sulfate. The best algorithm for length changes of concrete exposed to sulfate is BFGS quasi-Newton backpropagation algorithm while the best algorithm for weight changes of concrete exposed to sulfate is Polak-Ribiere conjugate gradient backpropagation algorithm.

Keywords: Class F Fly Ash, Class C Fly Ash, The Weight Change, The Length Change, Sulfate Resistance.

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THE FACTOR OF OPTIMUM ANGLE OF CARBON FIBER REINFORCED POLYMERS

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Abstract:

Carbon fiber reinforced polymer (CFRP) strips can be used to increase the flexural moment or shear capacity of reinforced concrete (RC) elements. This study presents an optimization methodology in order to investigate the factor of application angle of CFRP strips. In the optimization, the spacing of the strips, the width of the strips and angle of strips are the design variables. The objective function is to minimize the area of the CFRP strips per unit meter in order to increase the shear capacity of reinforced concrete (RC) beam. ACI318- Building code requirements for structural concrete regulation is used for the development of the design constraints. Metaheuristic algorithms inspired by natural phenomena are feasible methods for the problem. The present study involves two metaheuristic algorithms, namely flower pollination algorithm (FPA) and teaching learning based optimization (TLBO). In the final, the optimum results were compared with the optimization results with constant angles (45º and 90º). Although the usage of constant 90º is practical and 45º is the angle of principle stresses, the usage of the angle as a design variable is useful in minimization of the total CFRP area.

Keywords: Carbon Fiber Reinforced Polymer, Metaheuristic Algorithm, Optimization, Teaching Learning Based Optimization, Flower Pollination

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ASSESSMENT OF EXISTING MASONRY BUILDINGS BASED ON THE PRINCIPLE FOR DETERMINING BUILDINGS AT RISK IN TERMS OF SEISMIC LOADING

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Abstract:

The determination of the structural safety for existing masonry structures has become essential because of the completion of load-bearing members' life-cycle due to the environmental conditions, user intervention and the decrease in material strength in time. Considering these facts, the performance assessment of masonry structures which mainly aims to evaluate the seismic resistance is dictated by the current earthquake code. In recent years, another code is prepared to determine earthquake-prone buildings having very low seismic safety. It is intended to force pulling down these risky buildings for construction of new buildings so that high loss of life can be prevented in a significant earthquake. The new document uses performance-based principles, as it has already employed in the Turkish Earthquake Code for evaluation and assessment of the seismic resistance of existing buildings. The goal of this study is to perform the seismic assessment of existing masonry structures based on the new principle. In this study, a masonry structure is examined within the scope of field survey and numerical analyses. In this study, a masonry structure is examined within the scope of field surveys and numerical analyses. The first stage of the study includes existing state of the structure performed on damage evaluation based on observational examination. In the second stage the structure's three-dimensional finite element model is prepared and the seismic assessment of the masonry structure according to the current earthquake code.

Keywords: Seismic Assessment, Masonry Structures, Numerical Analysis

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THE EVALUATION OF EXISTING MASONRY STRUCTURES IN COMPLIANCE WITH THE GENERAL RULES IN TURKISH EARTHQUAKE CODE

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Abstract:

The masonry was one of the most widely used construction methods in the past. Ever then, the majority of existing masonry buildings have been constructed without a significant notification of seismic conditions and effects. This leads most of the existing masonry buildings to become vulnerable or collapse in an earthquake event. The aim of this study is to perform existing masonry structures with respect to the general rules in Turkish earthquake code. In this study, a masonry structure is examined within the scope of field survey and numerical analyses. The first stage of the study includes the investigations on the actual state of the structure for considering the compliance between architectural and static projects. The second step of the study includes the damage evaluation performed for the actual state of the structure based on observational examination. Finally, the structure is checked for the compliance with the conditions specified in the earthquake regulation.

Keywords: Seismic Evaluation, Masonry Structures, Earthquake Code

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ASSAD-KIRK TYPE FIXED POINT THEOREMS ON METRICALLY CONVEX METRIC SPACES

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Abstract:

Fixed point theory is one of basic subjects in the mathematical analysis and topology. Existence and uniqueness of solutions of differential and integral equations can be find by fixed point theory. Assad and Kirk in 1972 gave a sufficient condition for the existence of fixed points of multivalued mappings considering specific boundary condition in metrically convex metric spaces. In 1969, Nadler proved that every multivalued contraction on a complete metric space has a fixed point.Wardowski introduced the concept of F-contraction, which is show the existence and uniqueness of a fixed point for single-valued mappings on complete metric spaces. Then Altun, Minak and Dag introduced the concept of multivalued F-contractions and obtained some fixed point results for such mappings on complete metric spaces.Considering the Wardowski's technique,we give a new approach to the Assad--Kirk fixed point theorem on metrically convex metric spaces.We also provide a nontrivial example showing that our result is a proper extension of the Assad-Kirk fixed point theorem.

Keywords: Fixed Point, Multivalued Maps, F-Contraction, Metrically Convex Metric Space

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PRE-SUBADDITVE FUZZY MEASURES AND MULTI CRITERIA DECISION MAKING

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Abstract:

Fuzzy measure theory is an innovate and useful tool to model the interaction of criteria in multicriteria decision making (MCDM) problems. There are some remarkable studies that have handled fuzzy measure theory in MCDM problems. Besides, several authors have studied the identification of fuzzy measure. As identifying a fuzzy measure, determining the measure of each one of the subsets of a finite set is not an easy process. Grabisch has proposed the concept of k-order additive fuzzy measure in order to overcome this complexity. Recently a fuzzy measure, which is developed based on the evaluation of interdependence coefficients between criteria, has been identified to relieve the same complexity. In this talk we introduce the concept of pre-subadditive fuzzy measure. This allows us to relieve the complexity of fuzzy measure identification process. We use a particular set function which strongly depends on densities of singletons with interdependence coefficients and which provides redundancy between singletons. Hence, we represent a tool for multicriteria decision making environment.

Keywords: Pre-Subadditive Fuzzy Measure, Multicriteria Desicion Making

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ANALYZING OCCUPATIONAL ACCIDENTS INTERVENED BY AMBULANCE SERVICES USING DATA MINING ALGORITHMS

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Abstract:

Occupational accidents are unplanned and unexpected occurring in a workplace. It is one of the important health problems most of which are resulted by deaths. They are reported more than 2 million deaths annually in the World. It is also a major cause of injuries and deaths in Turkey. The aim of this study is to extract the occupational accidents from emergency cases intervened by ambulance services and examine them together with other information. The data had 133,953 cases recorded by 112-ambulance center in one-year period. There were 20 attributes such as team number, address, departure and arrival time, distance, age, gender, social security, operation explanation, diagnosis code and intervention type. Addresses including industrial areas and ICD codes belonging to accident type of information were scanned. The results were combined with team number appointed in industrial estates and accident types (fracture, cerebral trauma, poisoning, injury & rupture, cardiac & respiratory problems). 551 cases were considered as occupational accident and analyzed by three different data mining algorithms: CHAID, logistic regression and Bayesian network.

In CHAID, there were 3 nodes with respect to age and branches with respect to arrival time and covered distance. In Bayesian network, delivered hospital, intervention time, age and gender were found to be most important. In logistic regression, age, intervention time, gender and covered distance were found significant for most of the accident categories. It can be suggested that the results should be examined carefully to reduce the rate of occupational accidents and severity of the injury.

Keywords: Occupational Accident, Ambulance Service, Data Mining, Clustering Algorithms

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INVESTIGATION ON FLAMMABILITY AND MECHANICAL PROPERTIES OF POLYPROPYLENE/RED MUD POLYMER COMPOSITES

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Abstract:

In parallel with the continually increasing use of plastics, the issue of fire safety has come to the forefront. Flame retardancy of polymers has become essential in many application fields such as transportation, construction, and electrical industries. The burning process is comprised of five fundamental steps, which are, heating, decomposition, ignition, combustion and propagation.

In this study, polypropylene matrix contributes to ground red mud powder is handled as 0, 10, 20, 30 and 40 wt% ratio will be mixed in the extruder. Mixture obtained from the extruder to be granulated and then the granules will be obtained as appropriate standard test sample of the injection molding machine. Flammability and mechanical tests will be applied such as UL94, limit oxygen index (LOI), tracking index (CTI), elasticity modulus, yield strength, tensile strength at break, % elongation, Izod impact strength, hardness, density. Also, SEM examination will be conducted to evaluate the microstructure of red mud particles as well as material distribution in these experiments.

Keywords: Polypropylene, Red Mud, UL 94, Flammability, Limit Oxygen Index, Mechanical Properties

[*]*This work has been supported by the Scientific Research Project Program of Marmara University*

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TRIBOLOGICAL PROPERTIES OF HDPE/UREA FORMALDEHYDE POLYMER BLENDS

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Abstract:

Polymer alloys and blends are of great interest academically and technologically. In many cases, a balance between the hardness and toughness is desired. The hardness of many synthesized polymers is characterized by brittleness and crack propagation upon impact. Therefore, improvement of the toughness was the subject of academic and technological investigations.

In this study, tribological properties of the high density polyethylene/urea formaldehyde polymer blends were investigated. The addition of urea formaldehyde to high density polyethylene changed the tribological properties of the blends significantly. High density polyethylene matrix contributes to ground urea formaldehyde powder is handled as 0, 5, 10, 20 and 30 % ratio will be mixed in the extruder. Mixture obtained from the extruder to be granulated and then the granules will be obtained as appropriate standard test sample of the injection molding machine. SEM examination will be conducted to evaluate the microstructure of urea formaldehyde particles as well as material distribution in these experiments.

Keywords: Tribology, Polyethylene, Urea Formaldehyde, Powder, Polymer Blends.

[*]*This work has been supported by the Scientific Research Project Program of Marmara University*

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REMOVAL OF AMMONIUM NITROGEN FROM THE DAF-PRETREATED POULTRY SLAUGHTERHOUSE WASTEWATER BY LEMNA MINOR

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Abstract:

The poultry slaughtering industry has enormous economic importance as the quickly developed ranks among in Turkey over other industries. The paultry slaughtering industries generate large volume of wastewaters containing very high concentrations of organic matter Even though biological processes are effective and economical, long hydraulic retention time and large area requirements make sometimes these processes less attractive than physico-chemical treatments, which require shorter retention time.

In this study, ammonium, COD, colour and turbidity removal with using Lemna Minor (duckweed) was searched in poultry slaughterhouse wastewaters. Reason of poultry slaughterhouse wastewaters contain high konsantration of organic compounds , ammonia and fats. Wastewater was taken from effluent of Dissolved Air Flotation (DAF) unit, then using MAP proses, upper phase gave to reaktor which Lemna minor was being. COD , ammonia, color , turbidity parameters were analized after hidrolic retention time is 7 days.

The result of the study , Lemna Minor is effective in treatment of poultry slaughterhouse wastewaters. In this study especially ammonia removal investigated.At the same time COD, color and turbidity removal researched. In this study, ammonia removal efficient was around % 40, duckweed was effective in COD, color and turbidity removal.

Keywords: Lemna Minor (Duckweed), Poultry Slaughterhouse Wastewater, Ammonium Nitrogen, Magnesium Ammonium Phosphate (MAP); Dissolved Air

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BIOLOGICAL SOLID WASTE MANAGEMENT IN TURKEY AND IN OTHER COUNTRIES

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Abstract:

Today, the world is facing many serious challenges, including ever-growing human population and the consequent security for food, energy, and water. In addition, the greenhouse gas (GHG) emissions and various other pollutants are posing a serious threat to mankind due to anthropogenic climate change. As a result, the gap between environmental sustainability and economic growth is increasing. Therefore, the need for sustainable technologies and policies to mitigate climatic change and provide a constant supply of energy and feed has become critical for enabling circular economies in the developing countries. The sustainable disposal of waste is still in infancy in most of the developing countries due to limited allocated budgets, infrastructure and maintenance facilities. The high generation rates of organic waste and its disposal to open dumpsites or non-sanitary landfills are resulting in adverse environmental, economic and social problems. Reduction of landfills and dealing with the waste are among the key elements of the cleaner production and advanced environment policy. Composting represents one of the cleaner technologies in diverting organic waste from landfill. According to the latest report published by the Ministry of Environment, the amount of municipal waste generated in Turkey in 2014 was 27.1 million tons. Recycled municipal waste was 6% while 64% was disposed of in sanitary landfills and 30% in open dumping areas. Similar to other countries, it is planned to dispose of municipal wastes in Turkey with the most appropriate and economical methods. The present situation of the 81 provinces was determined and waste management strategies prepared for 2023 in Turkey. Facility types for planned waste management activities, capacities and investment costs arise on a regional basis. Municipal waste management planning was based on the objectives of the Waste Landfill Regulation and Packaging Wastes Control Regulation. In the present case, there are 8 biological waste processing facilities in Turkey. The provinces of Amasya, Aydin, Balikesir, Canakkale, Denizli and Kutahya have compost process while in Kocaeli and Sakarya provinces, biomethanization process was used. Moreover, there are 6 mechanical-biological pre-treatment (MBP) and recycling facilities where mixed municipal waste is processed. These are 2 compost and bioprocessing facilities in Istanbul, and 4 biomethanization processes in Ankara, Adana and Samsun. When the data are examined, waste amount in Turkey in 2014 was averagely 0.96 kg/person-day. Calculations of estimation of waste generated show that municipal waste in 2018 was 30 million tons, and it is expected to be 33 million tons in 2023. In the management plans, the waste formed in 2023 was targeted to 65% landfilled and 35% recovery. In the study, details of solid wastes management problems and success stories in Turkey and other similar countries are also been examined and results are discussed.

Keywords: Waste, Landfill, Management, Biomethanization, Recycling

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THERMO-HYDRAULIC PERFORMANCE OF DIFFERENT NANOFLUIDS IN A HELICAL COILED TUBE

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Abstract:

In this study, the flow and heat transfer characteristics of nanofluids in a three dimensional helical coiled tube under steady, laminer flow conditions are investigated numerically. The governing equations are solved using the Finite Volume Method (FVM) with SIMPLE algorithm. In studies, the effects on heat transfer performance and friction factor of different nanoparticle types (Al2O3, CuO, TiO2, SiO2) with varying particle volume fractions(ϕ=1%, 2%, 3%) in specific range of Reynolds number (200≤Re≤1200) under steady flow conditions are analyzed and geometric parameters are kept constant. The average Nusselt number, friction factor and thermo-hydraulic performance along the tube are calculated for tested parameters. The numerical results indicate that heat transfer performance enhances with increasing Reynolds number and particle volume fraction, at the same time the friction factor also increased. It is observed that the thermo-hydraulic performance is significantly affected from nanoparticle type, particle volume fraction and Reynolds number. The nanoparticle volume fraction and Reynolds number that provide the best thermo-hydraulic performance are determined for each nanofluid. The obtained results are given as a function of dimensionless parameters. It is shown that helical coiled tubes have a good potential to enhance heat transfer, if optimum nanofluid parameters under steady laminer flow conditions are used.

Keywords: Helical Tube, Nanofluids, Numerical Study, Heat Transfer, Friction Factor

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USE OF CHICKEN FEATHER FIBERS FOR INSULATION IN WINTER CLOTHES

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Abstract:

In ancient times, winter clothes were made of natural materials such as cotton, wool and bird feathers for heat insulation. Today, although more artificial materials are used for this purpose, natural insulation materials have not lost their importance as insulation materials, especially the downs of water birds. These materials which have specialties such as high heat protection, lightness, softness, long serviceability, are expensive enough. So, when compare the water bird feathers, chicken feather fibers have more advantage as easily accessible, much cheaper for use of filling materials in winter clothing. On the other hand, nearly 22mln. tonne chicken feathers are obtained as a by-product and more than 4mln. are thrown away. These materials which is chemically resistant, is buried and burnt.

Chicken feathers are natural heat insulation materials. However, it is not possible to utilize from chicken feathers like goose and duck feathers. Because, chickens do not have pile feathers different from goose and ducks. On the other hand, weight, fragility, low elasticity and root specialties of chicken feathers appear to be a problem. In order to overcome these problems. We proposed to utilize the fibers obtained by separating the 'barbs' part of chicken feathers from the 'rachis' part by mechanical cutting as a filling material in winter clothes. Research has shown that the chicken feather fibers have porous internal structure and this specialty gives them high insulation properties. Our research has shown that the use of chicken feather fibers as insulation material in winter clothes is not only economical but technically a good alternative to other insulation materials. The winter jackets made from chicken feather fibers have the same appearance as the goose feathers in terms of insulation, yet they have a beautiful appearance.

Keywords: Chicken Feather, Chicken Feather Fibers, Insulation Properties Of Chicken Feathers, Filling Material

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INVESTIGATION OF HYGROSCOPIC PROPERTIES OF CHICKEN FEATHER FIBERS

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Abstract:

The chemical structure of chicken feathers examined by many researchers has revealed that these feathers contain significant amount of amino acid(about 40%) which shows hydrophilic properties. This affects the hydroscopic properties of the fibers cutten from the chicken feathers, as well as gives chicken feathers considerably hydrophilic. Hygroscopicity is a very important feature of chicken feathers. The hygroscopic properties of the chicken feather fibers cutten from the chicken feathers, which is protein-based natural material, were investigated. The variation of the absorbing moisture ability of fibers obtained from the chicken feathers washed, disinfected and dried under certain conditions was examined in comparatively with cotton, wool and goose feathers. The ability of the absorbing moisture of chicken feather fibers changed according to the ambient conditions like other natural fibers it has been determined that this change was in accordance with the law. This feature is an indication that the use of these fibers, which is worse than just goose feathers according to ability of absorbing moisture, as a filling material in clothing is not a problem for comfort.

The amount of water taken by fibers in the wet environment and the variation of this amount was investigated according to the ambient temperature. The method has been developed and experimental studies have shown that the amount of water taken by the chicken feather fibers in the wet environment varies according to the ambient temperature.

In study, chicken feather fibers swell under the influence of water like other natural fibers. It was determined that the fibers in the aqueous environment have the ability of swell by about one-fourth of their normal diameter within about one minute. Under experimental conditions, chicken feather fibers didn't show any significant change as length.

Keywords: Chicken Feather, Chicken Feather Fibers, Hygroscopicity Of Chicken Feather Fibers

[*]This study is financially supported by the research project which number is 115M725 by TUBITAK.

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ROCKS HAVING HIGH POTENTIALLY TOXIC ELEMENTS CONTENTS AND INTERACTION WITH ENVIRONMENT

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Abstract:

The object of this study is to determined the heavy metals contents of soils and waters found between Nigde Gumusler-Camardi. soil samples were taken from 26 sampling points (0-20 soil depth) for each sampling location. GPS and soil analysis data were compiled into the GIS database. The established database was transferred to a GIS environment to produce surface layers of each variable by using Kriging (spherical variogram) method. The heavy metals contents of the soils in study area were found more than limit values. The water samples have higher copper, manganese, nickel and chrome contents than limit values. The high heavy metals contents in the soils and waters may be make toxic impact for vejetables, fruits and other culture plants growing in the sudy area, and if these heavy metals take in by the plants, they may be pass human body with food chain. The high amounts heavy metals content of soils and waters in the study area have been seen a important problem for environment and human healty.

Keywords: Potentially Toxic Elements, Soils, Waters, Soil Pollution, Water Pollution

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AN ALTERNATIVE VERSATILE MACHINING PROCESS: ABRASIVE WATERJET MACHINING AND ITS REMARKABLE APPLICATIONS

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Abstract:

Abrasive waterjet machining utilizes a high speed steady flow of water and abrasive particles that can be used to machine different kinds of engineering materials. Machining and cutting with abrasive waterjet equipment has a lot of advantages over other traditional machining processes. The most significant virtue is that no heat is created in the work piece. Availability of wide range of materials and low operation forces are also important features of the process. In practice, main applications of the process are abrasive waterjet cutting(AWJC), abrasive waterjet milling(AWJM) and abrasive waterjet turning(AWJT). Recently, restricted usage of abrasive waterjet machining increases rapidly in order to get quality products for several industrial areas. In this paper, we analyze thoroughly developments in equipment, process parameters and latest applications on suitable materials. In addition to that, we try to explain differences between abrasive waterjet machining and the other conventional methods to emphasize the possibility of the future implementation of the abrasive waterjet machining.

Keywords: Waterjet, Abrasive Particles, Machining, Cutting

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FINITE ELEMENT ANALYSIS FOR COMPRESSION BEHAVIOUR OF POLYMER BASED HONEYCOMB AND RE-ENTRANT STRUCTURES

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Abstract:

Advanced technology requires new manufacturing methods and new structures which are light, efficient and convenient in order to meet the needs of the industries. Recently, honeycomb and re-entrant (auxetic) cellular structures have been studied due to their unique properties such as energy and vibration absorbing capability, indentation resistance, homogeneous load distribution and being applicable to take a place in sandwich composite structures. Furthermore, polymer materials have been mainly used in many application because of their lighweight, excellent optical properties and to manufacture them less expensive and easily. The examined studies show that cellular structures can be manufactured by new trend additive manufacturing from various polymer materials. After doing literatur surveys about honeycomb and re-entrant structures, these structures with three different rib thicknesses of 1 mm, 1.5 mm and 2 mm were designed and then polymer material was selected to use in finite element analysis (FAE). In FAE, the compression loads were applied to honeycomb and re-entrant structure under determined boundary conditions, then, and their compression behaviour was investigated. In conclusion, the obtained FAE values were compared to determine the compression behavior of polymer honeycomb and re-entrant structures.

Keywords: Cellular Structure, Honeycomb, Re-Entrant (Auxetic), FAE, Polymer

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EFFECTS OF DIFFERENT NITROGEN SOURCES AND DOSES ON YIELD, YIELD COMPONENTS AND SOME TECHNOLOGIC PROPERTIES

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Abstract:

In this study it was used three different nitrogen sources (AN, AS and Urea) and five different doses (0, 5, 10, 15 and 20 kg/da) in order to Show the effect in fibre technological characteristic of cotton plant (Maras – 92) yield and yield components. In research it was analised what plant height, number of monopodial branches, number of sympodial branches, number of bolls per plant, cotton weight per boll, 100 seed weight, ginning out turn, boll weight, seed cotton yield, fibre finenes, fibre lenght and fibre strenght

In this research, the pozitive effect of nitrogen sources except cotton seed yield were not significant in all of the characters which were investigated, it was seen that the best yield of cotton with seed was available in plot of hand in urea application. In this study, was effect of significant analysed to other properties of different nitrogen doses, except plant height and seed cotton weight per boll. The seed cotton yield was determined in 20 kg/da nitrogen application (310 kg/da) and the highest yield was determined 15 and 20 kg/da nitrogen application. Again, the result of this study was effect of not significant interactions of different nitrogen sources and doses plant height, number of monopodial branches, number of bolls per plant, seed cotton yield, ginning out turn, seed cotton weight per boll, fibre finenes, fibre lenght and fibre strenght

According to the determined characteristic interactions of different nitrogen sources and nitrogen doses was effect of significant, 100 seed weight and fibre strenght and it was determined effect of significant fort he other characteristics.

Keywords: Key Words: Cotton, Gossypium Hirsutum L., Fertilizier, Doses

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ICENS 4TH INTERNATIONAL CONFERENCE ON ENGINEERING AND NATURAL SCIENCE
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A RESEARCH ON TO EFFECTIVE ON YIELD AND EARLINESS OF DIFFERENT SOWING TIMES AND GROWING TECHNIQUES IN SWEET CORN (ZEA MAYS SACCARATA STURTS) IN KAHRAMANMARAS CONDITIONS

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Abstract:

In this study it was used three different nitrogen sources (AN, AS and Urea) and five different doses (0, 5, 10, 15 and 20 kg/da) in order to Show the effect in fibre technological characteristic of cotton plant (Maras – 92) yield and yield components. In research it was analised what plant height, number of monopodial branches, number of sympodial branches, number of bolls per plant, cotton weight per boll, 100 seed weight, ginning out turn, boll weight, seed cotton yield, fibre finenes, fibre lenght and fibre strenght

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DIFFUSION WELDING OF NODULAR CAST IRON TO COPPER

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Abstract:

GGG60 grade nodular cast iron and pure copper was welded using a vacuum diffusion welding process. The cylindrical samples having a diameter of 8 mm and 8 mm in length were used. The flat surfaces of both samples were ground, and finally polished using 1 micron diamond paste. The prepared surfaces of samples were matched together. A vacuum furnace was used for diffusion welding process. For the diffusion, forging pressure and temperature were 4 MPa and 950 oC respectively. The diffusion welding of samples was carried out at 30, 60, and 90 minute duration. Before heating, the furnace was evacuated to 10-1 millibar for all welding processes. After welding the microstructure of welding interfaces were examined with optical microscopy on the perpendicular sections of the welds. The microhardness deviation from one matrix to another was measured. The mechanical properties of welding interfaces were determined using a specially designed shear test apparatus. The optical microscopy investigations were revealed that the welding interfaces of diffusion welded nodular cast iron and pure copper have a smooth morphology without any crack or pore. The microhardness measurements of welding interfaces showed that the hardness values differ slightly from one matrix to another one. It means a diffusion zone is occurred at the interface. The shear test results showed that the shear strength of welding interface is increased with increasing diffusion time at 950 oC diffusion process.

Keywords: Welding, Diffusion, Nodular Cast Iron, Copper, Interlayer, Hardness, Strength

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A LITERATURE REVIEW FOR APPLICATIONS OF SOFT COMPUTING ON AERONAUTICS

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Abstract:

This study discusses the works done by using soft computing techniques in the field of aeronautics. Soft computing is proposed by Zadeh in 1994 and the role model of the soft computing is human intelligence. Soft computing techniques produce tolerant results in unclear, uncertain, and partially accuracy situations and aims to solve the problem of full intersection sets. They also produce effective results in real world problems that ideal models cannot develop. Aeronautics is a field that is constantly improving and innovative field. The role model of soft computing is human intelligence. In this study, the place and importance of soft computing techniques in aeronautics will discussed. For this purpose, besides our own studies, the articles available in the literature will examined and interpreted. In addition to the available articles, a different and simple study based on soft computing techniques will also done. This study will compared with the other studies in the literature and the results will presented. In addition, it was discussed what could be done in the light of these studies in the future.

Keywords: Aeronautics, Soft Computing Techniques, Artificial Neural Network, Optimization Algorithm.

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OPTIMIZATION AND ESTIMATED PARETO FRONT OF THE OPTIMUM FUSELAGE DRAG COEFFICIENT

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Abstract:

This work presents a new method based on soft computing methods for calculating the optimum value of the fuselage drag coefficient. For this purpose, the Artificial Neural Network (ANN) is integrated into the Artificial Bee Colony (ABC) algorithm and a new method is developed. ABC algorithm is a fast and simple algorithm that is frequently preferred in engineering problems. ANN can produce an appropriate solution for a given problem using a dataset without the need for a function. However, the network structure and parameters that give the most appropriate result for each dataset in ANN can change, and this feature is disadvantageous in terms of calculating the optimum fuselage drag coefficient using only ANN. The ABC algorithm requires an objective function to calculate the best solution for any problem. In order to find the optimum value in this study, ANN based objective function is embedded into ABC algorithm. Thus, when ANN trained for different fuselage shapes calculates the fuselage drag coefficient, the ABC algorithm determines the best solution. However, in multiple optimization problems there can be more than one optimum solution that optimizes all objectives and these solutions are expressed in a set of non-dominated solutions or Pareto-optimal solutions. In this study, the results obtained using the new method as well as the Pareto front of the problem solutions is presented.

Keywords: Fuselage Drag Coefficient, Soft Computing Techniques, Pareto Front, Optimization

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INPUT VARIANCE CONSTRAINED CONTROL OF MORPHING TACTICAL UNMANNED AERIAL VEHICLES (TUAVS)

Sezer Coban[a*], Tugrul Oktay[b]

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Abstract:

In this study, using dynamic model of passive and active morphing featured Tactical Unmanned Aerial Vehicle (TUAV) called as ZANKA III which is produced in Erciyes University, Faculty of Aeronautics and Astronautics, Model Aircraft Laboratory, under the TUBITAK ARDEB 1001 program and designing Input Constrained Variance Controller (IVC) for aircraft tracking the desired trajectory achieved with minimal vibration and minimum energy consumption. For this purpose, using MATLAB, in the simulation environment, studies have been performed and closed loop responses have been obtained. Longitudinal motion is in primary. Effects of using variance constrained vibration control on Tactical Unmanned Aerial Vehicles are examined. For this purpose dynamic model of passive and active morphing featured Tactical Unmanned Aerial Vehicle (TUAV) called as ZANKA III which is produced in Erciyes University, Faculty of Aeronautics and Astronautics, Model Aircraft Laboratory, under the TUBITAK ARDEB 1001 program is used. It is found that when tight constrained is used, the peak values of outputs of interest decreases. On the other hand, the peak values of inputs of interest increases.interest, desired output is pitching angle of TUAV, and desired input is elevator angle.

Keywords: Tuavs, Flight Performance, Constrained Variance Controller.

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UNMANNED AERIAL VEHICLES (UAVS) BY ENGINE TYPE

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Abstract:

Unmanned Aerial Vehicles (UAVs) by Engine Type

Unmanned Aerial Vehicles (UAV) can be classified according to their civilian and military use and performance characteristics such as weight, distance to air, wing load, range and speed. In this study, the types of motor used in unmanned aerial vehicles and the advantages, disadvantages and differences between these types of motors are mentioned. Unmanned Aerial Vehicles(UAV) are used in many different tasks and need different engine types depending on the area they are used to perform these tasks. Two-stroke, Turbofan, Turboprop, Piston engine, Electric and Propeller types are different types of engines used in Unmanned Aerial Vehicles(UAV). Piston engines and electric motors are the most commonly used types. Unmanned Aerial Vehicles(UAV) also vary in engine size and type, as well as aircraft sizes and weights, as in humans. Electric motors are generally used in light and small models, while piston motors are used in heavy and large models.

Keywords: Unmanned Aerial Vehicles (Uavs), Engine Types

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DETERMINATION OF SOIL MOISTURE CONTENT AND SOIL PENETRATION RESISTANCE ACCORDING TO DIFFERENT SOIL TILLAGE

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Abstract:

Field experiment were conducted in Antalya/Aksu between 2015-2017 to evaluate the effect of different soil tillage systems on soil penetration resistance and moisture of soil from physical soil properties under a cotton cultivation and laboratory studies were carried out in Bati Akdeniz Agricultural Research Institute in Antalya (South of Turkiye). The soil of the experimental parcel was classified as silty.The experiments were arranged in a randomized complete block design with three replications. Statistical analyses were used to compare the different soil tillage methods. In this study, four different conversation tillage systems (disc harrowing, rotarytiller and roller (S1), cultivator and scrubber (S2), rotary cultivators and scrubber (S3), rotarytiller and roller (S4) were compared in terms of their effects on some physical properties of soil (soil penetration resistance and moisture of soil). The moisture of soil values were determined in two period (after tillage and after harvesting operation) and in three depth of soil (0-10, 10-20 and 20-30 cm) and also, penetrometer resistance values were determined in 2 period (after tillage and after harvesting operation) and in 4 in depth of soil (10, 30, 40 and 60 cm). Maximum soil moisture contents were observed in soil tilled with S1 at 20-30 cm soil depths after harvesting operation in the third year as 26.05% and Minimum soil moisture contents were determined in soil tilled with S3 at 0-10 cm soil depths before tillage in second year as18.70%. Maximum penetrometer resistance values were measured in soil tilled with S1 at 60 cm soil depths after harvesting operation in the third year as 3,25 MPa and penetrometer resistance values determined in soil tilled with S2 at 0-10 cm soil depths after harvesting operation in second year as 0.89 MPa

Keywords: Tillage, Conversation, Penetration, Moisture, Soil

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SHAPE FACTOR OF NANOFLUID ON THE THERMAL PERFORMANCE OF A DOUBLE PIPE HEAT EXCHANGER

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Abstract:

In this study, thermal performance of a double pipe heat exchanger with SiO2-water nanofluid of various particle shapes was numerically investigated. Various nanoparticle shapes such as cylindrical, blade and spherical are added to the water in the range of particle volume fraction between 0% and 2.5%. Numerical simulations were performed by using Galerkin weighted residual finite element method. The numerical simulations were performed by using a commercial code COMSOL. Effects of nanoparticle volume fraction, shape of the particles, mass flow rate and inlet temperature on the variation of heat transfer and fluid flow characteristics were examined. It was observed that overall heat transfer coefficient enhances by using nanofluid. Among various particle shapes, cylindrical ones were found to perform better in terms of heat transfer enhancement and spherical ones perform the worst. There are variations in the heat transfer performance for different mass flow rate and various inlet temperatures when considering nanoparticles of different shapes.

Keywords: Double Pipe Heat Exchanger, Nanofluid, Sio2 Nanoparticles, Finite Element Method

[*]*This study is supported by Scientific Research Projects Unit (BAP) of Manisa Celal Bayar University for the project no: 2017-010*

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NUMERICAL SIMULATION OF THERMOACOUSTIC IN A RIJKE TUBE AND APPLICATION OF NONLINEAR ANALYSIS TOOLS

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Abstract:

In this study, thermo-acoustic phenomena in a Rijke tube with different heat source characteristics was numerically examined. The numerical simulations were performed in a closed-open type resonator with a stack type heat source. The governing equations were solved for compressible flow by using finite volume method. Various heat sources with spatially varying characteristics were considered. It was observed that the pressure fluctuations in the vicinity of the heat source result in limit cycle oscillations. The amplitude and frequency of the oscillation do not vary while a phase shift in the pressure oscillations due to the different spatially varying heat source characteristics is observed. Recurrence plot analysis tools were utilized to investigate the short term and long term dynamics of the system. Recurrence quantification analysis measures were used to compare the dynamics of the systems with different heat source characteristics. The dynamic characteristics of the thermo-acoustic system with various heat sources were shown to be affected.

Keywords: Thermo-Acoustic, Rijke Tube, CFD, Recurrence Quantification

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CHANGES OF TOTAL PHENOLIC COMPOUNDS AND RESVERATROL CONTENT DURING DIFFRENT RIPENING PERIOD OF SELECTED RED GRAPES VARIETIES GROWN IN AEGEAN REGION OF TURKEY

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Abstract:

Grapes (Vitis vinifera L.) are rich in polyphenols; the phenolic composition of grape is very complex and depends on several factors, including grape varieties, ripening stage. Red grapes are among the most valuable sources of phenolic compounds. These compounds are probably responsible for most of the beneficial effects of grapes with respect to a number of chronic diseases, cardiovascular diseases and aging. During ripening, grape berries undergo several modifications, such as changes in the phenolic composition, phenol extractability indices, and mechanical properties, even if the heterogeneity of the grapes can affect the reliability of the results. Veraison marks the beginning of ripening in grape, and a lot of events are initiated in this phase, like a change in skin color, berry softening and organic acid decline. In this study the concentration of total phenolic compounds and trans-resveratrol amount of red grapes (Calkarasi and Shiraz variety) from Aegean Region of Turkey were determined. Two different cultivation areas and four different ripening stages (Lag phase, Veraison, Maturity and Late Harvest) were considered. The quantification of total phenolics was performed by using the Folin-Ciocalteu spectrophotometric method. The trans-resveratrol content were carried out using the HPLC-DAD.

Significant decrease for total phenolic compounds existed in both red grape varieties in relation to maturity stages. Shiraz grape has the highest amount of total phenolics (4202.0 mg GAE/L) at the lag phase stage in the analyzed grapes. Total phenolic concentrations in Shiraz variety and Calkarasi variety at different ripening stages ranged from 4209,2±1,72 mg GAE/L to 2163,9±0,78 mg GAE/L and from 3097,5±1,84 mg GAE/L to 1523,4±0,68 mg GAE/L, respectively. Analysis of trans-resveratrol evidenced a decreasing trend for both during ripening period.

Keywords: Red Grape, Ripening, Total Phenolic Compounds, Trans-Resveratrol, Hplc

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GEOCHEMICAL CHARACTERISTICS OF LISTVENITES IN THE DAGKUPLU OPHIOLITE (ESKISEHIR, NW TURKEY)

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Abstract:

This study indicates geochemical characteristics of the listvenites in the Dagkuplu ophiolites. The listvenites are located in the vicinity of Sakariilica thermal area in the north of Eskisehir. This area is known as a highly tectonic region due to the fact that Izmir-Ankara Suture Zone (IASZ) developed during collision between Sakarya Zone and Anatolide-Tauride Block resulting from closure of the northern branch of Neotethyan Ocean is situated here.

The major, trace and rare earth element analyzes were carried out by taking samples from the listvenites formed as a result of metasomatic / hydrothermal alteration of the serpentinites in the Dagkuplu ophiolites.

According to the results of geochemical analysis; the lisvenites were enriched in SiO2, Fe2O3, and K2O; depleted in MgO and CaO with respect to serpentinites. Especially the changes in SiO2 (% 93.04) and MgO (% 93.54) are remarkable. Similarly, the lisvenites were enriched in Ba, Nb, Rb, Sr, V, W, Zr, Mo, Cu, Ni, As, Sb, Au, and Hg according to trace elements results. It is a well-known fact that some metallic elements such as Au can be found at economic ratios in the listvenitic rocks. The amount of Au in the Dagkuplu listvenites is 2.4 ppb on average and cannot be evaluated economically. On the other hand, their Cu (21.65 ppm), As (4482 ppm), Mo (29.67 ppm), and Sb (115.53 ppm) proportions are very high and this suggests that the listvenites in the Dagkuplu ophiolites are typically controlled by silica-rich hydrothermal solutions.

Keywords: Listvenite, Dagkuplu Ophiolite, Eskisehir

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AN EXPERIMENTALLY EFFICIENT METHOD FOR HARMONIC-DOMAIN MODELLING OF PHOTOVOLTAIC (PV)-BASED DISTRIBUTED GENERATION UNITS

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Abstract:

The use of PV-based distributed generation units has become widespread in today's power systems. One of the most important advantages of the DG units is that the decrement of transmission and distribution losses in the network since they are connected to the network near the consumers. In addition to that, the electricity generation of the renewable energy based DG units reduce the dependence on the fossil fuel for the electricity generation. Thus, the reduction of CO2 and other greenhouse gases is provided to avoid global warming. However, most of the renewable energy based DG units such as PV power plants are connected to the network via the power electronic circuits called as inverters, which injects the harmonic distortion into the system. The harmonic distortion causes several adverse effects on the power system equipment as extra losses and overheating in the lines, transformers and rotational machines, torque pulsations in rotational machines and malfunctions of the protection and measurement devices. Accordingly, harmonic modeling and analysis of PV-based DG units have received great interest in the literature. In this study, firstly, PV-based DG units are modelled in time-domain by using MATLAB/Simulink. Secondly, the effects of the power quality disturbances, rms variations, imbalance and distortion of the grid voltages, and environmental factors, solar irradiation and ambient temperature, on the harmonic spectrum of the PV-based DG units are investigated via the Simulink model. And then, by means of Response Surface Method (RSM), which is a experimentally efficient method to express the inputs and outputs of the systems, the obtained results are used to provide the harmonic modelling of the PV plants in terms of the considered power quality and environmental factors. Finally, to show the validity of the developed harmonic domain model, it is comparatively evaluated with the time-domain model under the different test conditions.

Keywords: Imbalance, Harmonics, PV Plants, Distributed Generation

**The study is supported by TUBITAK.*

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GLUTEN-FREE PASTA PRODUCTION WITH HIGH PROTEIN VALUE

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Abstract:

Buckwheat is a gluten-free pseudocereal included in the Polygonaceae family. It is rich in polyunsaturated essential fatty acids, minerals and vitamins, dietary fibre, starch, antioxidant compounds and protein of high nutritional value. Buckwheat has great potential for various foods due to its gluten-free structure and functional features. Furthermore, buckwheat has various health benefits such as antioxidant and free radical scavenging activities. Pasta production is one of the best alternatives for the use of this high nutritional value grain. Gluten-free products are of great importance for people who are suffering celiac disease. The disease is found in individuals who are genetically susceptible and it is caused by an immune deficiency triggered by ingestion of gluten or related prolamines. The only known cure for this intolerance is a strict life-long diet with gluten-free products. Corn and rice are the most abundant grains that are used for gluten-free products, however, considering their chemical nature they serve a lower nutritional value. Thus, ancient grains containing high protein, vitamins and minerals, such as buckwheat and teff, are very good alternatives for both individuals with celiac disease and for the ones who choose to have a vegetarian or vegan life style. Buckwheat pasta offers a cheap and safe alternative for the target groups.

Buckwheat pasta supplemented with two different gluten-free flours obtained from legume and cereal grains and a biological food additive as a natural thickener were tested for gluten-free pasta production. Box-Behnken Design of Experiments was used in three levels in order to reach enhanced nutritional values together with desirable pasta qualities. Iron and protein values were enhanced with the supplementation of tested flours. The results of the experiments revealed that the suggested formula for gluten-free pasta production is a nutritious alternative for gluten-free products with a significant contribution to the food industry.

Keywords: Ancient Grains, Buckwheat, Gluten-Free, Pasta

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NONLINEAR SEISMIC RESPONSE OF MASONRY-INFILLED REINFORCED CONCRETE FRAMES WITH TYPICAL WINDOW AND DOOR OPENINGS

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Abstract:

In current construction practice, reinforced concrete (RC) framed structures are usually infilled with unreinforced masonry panels. The composite behavior of the resulting infilled frame under lateral loading is different to that of bare frames, since both the presence of infill panels and the interaction between the bounding frame and infill highly affect the dynamic response of the structure. Besides, prevalent openings for functional reasons, such as windows and doors, may lead to substantial uncertainty in order to assess the seismic response of infilled RC frames depending on their size, position and shape. Therefore, the ability to assess the nonlinear seismic behavior of such structures considered as one of the most complicated issues in the area of structural engineering is of great importance. This paper investigates the nonlinear behavior of masonry-infilled RC frames with rectangular window and door openings by means of pushover analysis. Three different positions of window and door openings in infill wall commonly encountered in construction practice are taken into consideration in numerical models. The lateral stiffness and strength of infill wall influenced by the position and percentage of the opening is taken into account through stiffness reduction factors (SRF) obtained from finite element analysis of infilled frames under monotonic loading, where infill-frame interaction is modeled by gap elements. The constitutive model and the width of equivalent diagonal compression strut are modified by the derived SRFs. The resulting capacity curves constructed using a displacement controlled pushover analysis are illustrated by graphs both for infilled frames with window and door openings. The variation in characteristic base shear forces and top displacements of capacity curves, and also in interstory drift ratios reveal the effect of window and door opening on nonlinear behavior. It is found that openings upon diagonal are more influential, since diagonal compression strut mechanism cannot effectively develop.

Keywords: Infilled RC Frames, Window And Door Openings, Stiffness Reduction Factor, Equivalent Compression Strut, Pushover Analysis

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NARX BASED FORECASTING INTERFACE FOR TIME SERIES ANALYSIS: T-SEER

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Abstract:

Today time series are widely used in many scientific areas. Determination of the magnitudes that vary with time, and later estimates of future with these values is a matter that has been closely related to human beings for centuries. In the analysis of the time series, generally ARIMA-like statistical methods are preferred. However, advances in artificial intelligence studies show that artificial neural networks may be more successful than well-known statistical approaches in pattern recognition and forecasting. MATLAB software that is widely preferred by many scientists contains an artificial neural network toolbox. Our work is the development of a NARX-based time series analysis and forecasting software using the MATLAB App Designer programming environment, which was first introduced in 2016. With the developed application, data files stored in CSV format can be easily analysed via interface and all parameters related to estimation can be easily changed by a novice user to make predictions, to calculate estimation performance and to produce graphical results.

Keywords: Forecasting, Interface, Matlab, NARX, Prediction, Software, Time Series, T-Seer

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DESIGNING A WEB BASED DATA ACQUISITION SYSTEM FOR BATTERY-POWERED WIRELESS SENSOR NODES: WIFILAB

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Abstract:

Measurement of physical quantities such as temperature, humidity, vibration, light intensity and color by using sensors and recording the sensed data has almost become a necessity for all studies related to natural sciences. The increasing number of parameters to be measured, the necessity of using multiple sensor types, and data collection with wired devices over distant and mobile systems are difficult and laborious task. It is aimed to communicate multiple sensors to a central unit without using cables and to store the measurement data on a web based recording platform.

The proposed system WifiLab requires no cable connection between sensor and data recording tool. The proposed data acquisition system is settled on an APACHE-based web server and MySQL database. The PHP scripting language is also preferred for coding server-side scripts. All Wi-Fi-based sensor nodes are in the client role. The data obtained from the sensor nodes is transferred to a wireless network created by the proposed system using the IEEE 802.11 communication standard and is recorded in the MySQL database via the master collection unit which is connected to the same network. After data acquisition period, the recorded data can be exported as a comma separated value file for later analysis using different analyze software.

Using the developed data collection platform, many sensors can transmit data synchronously with low latency and the transmitted values can be recorded in the web environment. It is especially seen that the developed system is extremely useful and successful in data collecting especially through moving objects when the freedom of movement is obligatory. By means of the developed system, it is now possible to collect data from hundreds of battery-powered wireless sensor node at the same time.

Keywords: Wireless Data Acquisition, Battery Powered Sensor Nodes, Web Based Data Acquisition, Wifilab, Sensor Signal Analysis

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THE DETERMINATION OF THE EFFECT OF WHEELS AND FENDER GAP ON DRAG FORCE ON A BUS MODEL BY COMPUTATIONAL FLUID DYNAMICS (CFD) METHOD

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Abstract:

The aerodynamic drag forces significantly affect the vehicle's performance, fuel consumption, acceleration properties, handling characteristics, environmental pollution, noise and comfort. The drag force is increased proportionally with the square of the speed. Because of buses perform cruising at high speed in intercity a bus model was chosen to investigate of aerodynamic force in this study. The flow structure around a 1/64 scaled bus model is investigated using computational fluids dynamics method. The effect of the wheels and the fender gap on the total drag force is determined. Flow analysis and determination of the drag force were carried out in the Fluent® program at 4 different free flow speeds. CFD analyzes were made at the range of 173 000 - 346 000 Reynolds numbers. To ensure geometric similarity 1/64 scaled licensed model bus is used. For the kinematic similarity blockage rate was % 4,75. In studies Reynolds number independence is used to ensure dynamic similarity. As a result of the flow analyzes 3.91% of the drag force results from the wheels and fender gap.

Keywords: Aerodynamic Drag Coefficient (CD), Drag Force, Fluent®, Bus Model, Cfd

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EXPERIMENTAL INVESTIGATION OF EFFECT OF N-HEXANE FUEL ADDITIVE IN DIESEL FUEL ON ENGINE PERFORMANCE AND EMISSIONS

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Abstract:

Greenhouse gas emissions from the use of fossil fuels; the most important causes of climate change. Emissions of nitrogen oxide (NOx) and particulate matter (PM) from diesel engines are a serious problem. Significant research is being conducted around the world to reduce emissions and fuel consumption based on diesel engines. Alternative methods have been tried to get low emissions and better engine performance by blending biofuels such as alcohol into diesel fuel. In this study, the experiments were performed in a single-cylinder diesel engine by addind 8% and 16% n-hexadecane by volume in diesel fuel (D0). As n-hexadecane ratio increases in diesel fuel, specific fuel consumption decreases while torque increases at all rpm. At 1400 l / min at which maximum torque is obtained, the torque of DHD16 fuel increased by 1.09% compared to D0 fuel, while the specific fuel consumption decreased by 1.53%. At 1400 1 / min, the CO, HC and soot emissions decreased respectively 6.31%, 18.41%, 4.46% while the NOx emission increased 8.75% in the DHD16 fuel compared to D0 fuel.

Keywords: Diesel Fuel, N-Hexadecane, Fuel Additives, Exhaust Emissions, Engine Performance

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EFFECTS OF METAL ION SENSORS ON FLUORESCENT PHOTOCHROMIC ORGANIC COMPOUNDS CONTAINING BISTHIAZOLE RING

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Abstract:

Fluorescent photochromic diarylethers are of great interest in recent years as they can be used to produce promising optoelectronic devices such as molecular keys and optical memories. A small amount of molecules for fluorescent detection is sufficient. Even single molecules can be detected using fluorescence. Due to their potential applications in medicine, the environment and biological chemistry, fluorescent sensors are essential for the detection of metal ions with desirable properties. To date, numerous works have been reported on fluorescent sensors that recognize many metal ions. However, it is still a challenge to develop sensors that can selectively detect different metal ions in different solvent systems. Photo-switchable ligands could be used to change photochromic and fluorescence properties of the molecule when they interact with the metal cations. In this work, a new fluorescent diarylethenes with bistiazole group were synthesized. Diarylethene possessing a bithiazole group has been investigated photochromic fluorescence properties. Metal-binding effects on the absorption and fluorescence spectra of this diarylethene was also investigated with various metal ions in acetonitrile solutions. The synthesized compounds were able to recognize different metal ions in different solvent systems. It has been found that the emission intensity can be increased significantly in acetonitrile when bound to certain transition metals.

Keywords: Diarylethene, Bisthiazole, Metal Ion, Fluorescence, Photochromism

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CORROSION INHIBITION PROPERTIES OF BENZIMIDAZOLIUM QUATERNARY SALTS ON LOW CARBON STEEL IN ACIDIC MEDIA

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Abstract:

The most common acid corrosion inhibitor inhibitors are organic compounds containing nitrogen, sulphur and oxygen atoms. It is known that organic compounds containing nitrogen are effective corrosion inhibitors in hydrochloric acid solutions. Benzimidazoles are heterocyclic aromatic organic compounds containing nitrogen atoms. Benzimidazoles and their derivatives can adsorb on the metal surface due to the presence of nitrogen atoms and aromatic rings in the molecule structure. For this reason, it has been observed in many studies that they exhibit strong inhibitory ability to prevent metal wear in various media. First, benzimidazole quaternary ammonium salts were prepared. For this synthesis, 1-substituted benzimidazole compounds were prepared by reacting benzimidazole and alkyl halides with KOH in EtOH solution. The 1-substituted benzimidazole derivatives are then reacted again with the same or different alkyl halides to synthesize 1,3-dialkylbenzimidazolium halide. Corrosion inhibition of synthesized molecule on low carbon steel in %15 HCl solution is investigated by Electrochemical Impedance Spectroscopy (EIS), Dynamic Electrochemical Impedance Spectroscopy (DEIS), Tafel Polarization (TP) and surface analysis (Scanning Electron Microscopy with Energy Dispersive Spectroscopy) techniques. Results showed that there were strong correlations between from applied measurement techniques. The inhibition efficiency increased with increase in concentration of inhibitor.

Keywords: Benzimidazolium, Corrosion, Inhibitor, Acid Solution, Low Carbon Steel

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THE NONLINEAR OPTICAL PROPERTIES OF TRIPLE DELTA-DOPED QUANTUM WELLS

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Abstract:

In this paper, we reported the effect of applied non-resonant intense laser field on the linear, third-order nonlinear, and total optical absorption coefficients and relative refractive index changes in n-type triple Si delta-doped quantum well potential profile in a GaAs matrix for three different central doping concentrations. Here we are working in the effective mass and parabolic band approximations in order to compute the subband energy levels and their corresponding wave functions of the system by diagonalization procedure. The linear, third-order nonlinear, and total optical absorption coefficients and relative refractive index changes of the structure are obtained using the compact matrix density formulation and iterative method. The numerical results obtained from the present work show that the external non-resonant intense laser field and the central doping concentrations play an important role in the nonlinear optical properties of n-type triple Si delta-doped quantum well potential. In particular we find that for the chosen configuration the linear, third-order nonlinear, and total optical absorption coefficients and relative refractive index changes are in the far-infrared region and that can be suitable building blocks for photodetectors in this range of the electromagnetic spectra. These results can be used to tune and control the electronic and optical properties of the n-type triple Si delta-doped quantum well.

Keywords: Nonlinear Optical Property, Delta-Doped Quantum Well, Intense Laser Field

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STUDY OF ELECTRON-RELATED OPTICAL RESPONSES IN TIETZ-HUA QUANTUM WELL: ROLE OF APPLIED EXTERNAL FIELDS

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Abstract:

In this present study, we theoretically investigated the effects of applied external fields, such as intense laser field, electric and magnetic fields on the optical absorption coefficients and refractive index changes in the Tietz-Hua potential quantum wells by using compact density matrix approach and iterative method. For this, we first calculated the subband energy levels and their corresponding wave functions of the structure by solving the one-dimensional Schrodinger equation within the effective mass approximation and envelope wave approach. Our theoretical results show that the optical absorption coefficient (ACs) and refractive index change (RICs) in the Tietz-Hua potential quantum wells are sensitive to the applied external fields. The absorption spectra in the Tietz-Hua potential quantum can be adjusted according to purpose by changing the strength of the applied external fields and these results can be used to tune and control the electronic and optical properties of the Tietz-Hua potential quantum wells.

Keywords: Tietz-Hua Quantum Well, Optical Response, Intense Laser Field

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TOPSIS MULTICRITERIAL DECISION MAKING METHOD APPLYING FOR THE LOCATION OF DAM

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Abstract:

The dams cover a river valley and accumulate water behind it; accumulating water is a vital plant for energy production, drinking water supply, and irrigation of agricultural areas. It is also possible to perform flood control with the help of dams. Considering the importance of these facilities, the location of the dam is very important. In this study, it was aimed to determine the most suitable choice by determining important criteria for the selection of a dam site on Ceyhan River in Kahramanmaras, Turkey. When this study was carried out, the TOPSIS method was chosen from the Multiple Criteria Decision Making Methods. Decision by the TOPSIS method is intended to be an ideal alternative to the ideal solution being close and not ideal non-solution. The decision criteria based on the decision matrix are; Filling and excavation amount, transportation and personnel facilities, expropriation and infrastructure, distances to material quarries, derivation easiness, solid matter flow, geological structure and topography. In order to reflect the relative importance of the criteria in the solution phase of the TOPSIS method, eigenvalue operations were performed by giving weights and the aim was to find the closest solution to the ideal solution. One of the the three most likely options were chosen. As a result of the study, the TOPSIS method can be used as an efficient method in dam site selection.

Keywords: Dam Structures, Dam Site Selection, TOPSIS Method, Multi Criteria Decision Making

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STEEL PIPE SUPPLIER SELECTION WITH PROMETHEE METHOD

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Abstract:

In this study, a supplier selection was made for the construction of an emergency line. For this, it is aimed to determine the most suitable supplier by comparing the characteristics of the manufacturer companies according to their superiority and weaknesses. Supplier selection is a hard multi-criteria decision-making problem which has several factors to be considered. In this context, solving the problem correctly depends on the scientific methods in decision process. The PHOMETHEE method is the preferred method for decision making. Supplier selection with PROMETHEE has two important advantages in addition to other ranking methods. One of these advantages is that a different preference function can be used for each factor used in the evaluation of alternative suppliers; and the second is to obtain partial and complete sequences of alternatives. As the main evaluation criteria; economy, strength, pressure resistance, lightness, high safety connection systems, flooring is taken. After the partial and full priorities are determined, the results are evaluated on the GAIA Plane and the final decision is reached. As a result, a ranking process was performed between five different companies and the most suitable candidates were selected.

Keywords: Supplier Selection, Steel Pipe, Multi Criteria Decision Making, PROMETHEE Method

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A THEORETICAL INVESTIGATION OF THE STRUCTURAL AND ELECTRONIC PROPERTIES OF CALCIUM TELLURIUM

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Abstract:

The crystal structure of the CaTe compound was studied up to 150 GPa under high hydrostatic pressure using the density functional theory (DFT) with the generalized gradient approximation (GGA). Pressure-volume relationships, structural transitions and electronic properties in CaTe compound are investigated using Siesta method. CaTe crystallizes in the NaCl-type (B1) structure (space group: Fm-3m) in ambient conditions. CaTe transforms from this structure to CsCl-type (B2) structure (space group: Pm-3m) at high pressure. This transformation is based on a intermediate state with space group R-3m. Moreover, the electronic band structure and some physical properties such as the lattice constants, the bulk modulus and the pressure derivative of the bulk modulus of the B1 and B2 phases of CaTe have been calculated. Furthermore, we study this phase transition using the total energy and enthalpy calculations. According to these calculations this transformation is obtained at about 33 GPa. We show that our calculated values are in good agreement with the values reported in the literature.

Keywords: Cate; Ab-Initio; Intermediate State; Phase Transition

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STRUCTURAL AND ELECTRONIC PROPERTIES OF CALCIUM SELENIDE UNDER HIGH PRESSURE: AN AB INITIO CONSTANT PRESSURE STUDY

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Abstract:

We have investigated the pressure induced phase transition and electronic properties of Calcium selenide (CaSe) using density functional theory under high hydrostatic pressure. Parrinello-Rahman method was used to apply external pressure to the system. CaSe crystallizes under normal conditions in cubic NaCl-type (B1) structure with space group Fm-3m . Pressure was increased with an increment of 10 Gpa up to 250 GPa and then we obtained a phase transition from this NaCl type structure to the another cubic CsCl-type (B2) structure with space group Pm-3m. This phase transition is also studied by total energy and enthalpy calculations. According to these calculations, at about 35 Gpa, we obtained phase transition in good agreement with the experimental results. Also we have calculated some physical properties of CaSe such as lattice parameters, volume, bulk modulus and its pressure derivate at 0 GP. This results are compared with other theoretical and experimental studies, and generally, the good agreements are obtained.

Keywords: Phase Transition, High Pressure, Ab-Initio, Dft

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DISPOSAL AND MANAGEMENT OF MEMBRANE CONCENTRATES FROM INDUSTRIAL WASTEWATER RECLAMATION PLANTS

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Abstract:

The number of industrial wastewater treatment plants employing membrane processes for wastewater reclamation and reuse is rapidly increasing globally mainly due to the drivers including water scarcity affecting production processes, reductions in capital and O&M costs of membrane processes and more stringent discharge regulations. Although there is no default and globally accepted solution for the treatment and/or disposal of membrane concentrates in each industrial plant, there are various management, treatment and disposal options employed successfully so far. However, due to the heterogeneous nature of industrial wastewaters some plants may experience difficulties in managing, treating and\or disposing their membrane concentrates. Disposal and management techniques are project-specific in these plants. Because of increasing environmental concerns and more stringent discharge limits, concentrate management and disposal became the major driver in the selection of membrane processes particularly for industrial wastewater reclamation projects. Some industrial membrane plants employ zero liquid or near-zero liquid discharge approach mainly due to discharge limits and to increase their overall water recovery. Various thermal and polymeric membrane based technologies are used to treat primary membrane concentrates (e.g., reverse osmosis concentrates), increase overall water recovery and reduce concentrate volume to be discharged. However, especially thermal processes (membrane distillation, evaporation, etc.) require high investment and O&M costs, which may result in reduced feasibility for the application of membrane processes in industrial wastewater reuse projects. While dealing with membrane concentrate disposal problem, the main outcomes of membrane process investments including very high product water quality to be reused, the preservation of fresh water sources by wastewater reuse and reduced volumes of pollutant discharges to water bodies compared to conventional treatment are sometimes overlooked.

Acknowledgement: This work was conducted partly from the MEMKON project. We thank the Turkish Ministry of Environment and Urbanization for granting the MEMKON project.

Keywords: Membrane Concentrate, Nanofiltration (NF), Reverse Osmosis (RO), Industrial Wastewater, Wastewater Reuse

**This work was conducted partly from the MEMKON project supported by the Turkish Ministry of Environment and Urbanization.*

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INVESTIGATION OF ENERGY EFFICIENCY POTENTIALS IN INDUSTRIAL STEAM BOILERS

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Abstract:

Energy is one of the most significant component of the socio-economic development processes of countries. Although countries vary depending on their level of industrialization, manufacturing industry on a global scale is responsible for about 37% of total energy consumption. Steam boilers are widely used in manufacturing industry, especially in the supply of thermal energy. Industrial steam systems constitute approximately 30% of the total energy consumption of the manufacturing industry. Despite the existence of significant potential for energy efficiency improvement in the steam systems, this potential is largely unrealized. The lack of information about the potential savings and its magnitude as well as lack of suitable policy frameworks and supporting programs are key reasons why this potential remains untapped. In this study, energy efficiency implementations in industrial boilers and distribution systems were investigated. Potential savings, payback periods and emission reduction ratios were evaluated by the investigation of various energy efficiency techniques. In this context, the potential saving on total energy consumption is about 3-20% by the application of energy efficiency techniques such as isolation of steam boilers and steam distribution systems, use of variable speed drives and economizers, optimization of steam boilers, preheating of inlet air and feed water, heat recovery from boiler blowdown and flash. The estimated payback periods of these techniques may be shorter than 3 years depending on the application.

Keywords: Clean Production, Energy Efficiency, Payback, Reduction, Steam Boiler

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COMPARISON OF ORGANIC ANIMAL PRODUCTION IN TURKEY TO THE EUROPEAN COUNTRIES

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Abstract:

Food production must increase 60% by the year 2050 with an expected 9 billion population. The share of the organic animal products in this increase should be emphasized more in terms of human health, environmental protection and social balance. As of 2016, the total organic area in Turkey is 533.218 hectares, being above average of 28 European countries with a total of 11.9 million hectares. However, organic retail sales in Turkey is 3.6 million Euros as compared with 7.910.0 million Euros in Germany only. The number of animals under organic production in 28 European countries contains 2.845.891 beef cattle, 864.142 dairy cows, 978.559 pigs, 4.485.075 sheep, 718.094 goats, 17.810.739 broilers and 13.856.636 laying hens as compared with only 1.215.632 total animals of these species under organic production in Turkey. Concentrate feed production in dry matter is 1.275.485 metric tons in European countries compared with that of very small numbers in Turkey in spite of more emphasis in organic forage production of 359.259 tons. The demand for organic animal products in Turkey increases every day although the price of these products are relatively high because of the consumer perception that organic animal products are healthier. The aim of this review is to compare organic animal production in Turkey to the European countries, and to contribute to the current and future perspectives of Turkish organic animal production system.

Keywords: Organic Animal Production, Turkish System, European Countries

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THE DYEING OF WOOL FABRICS WITH BARBERRY SHRUB BRANCHES

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Abstract:

The nature has been polluted to an extreme extent by people for almost the last 50 years. To prevent this pollution not only the scientific world but also many organizations are involved in various activities. In this study, information was given about the textile applications that can be done in order to protect the environment. For this aim a natural dye source, barberry shrub branches (Berberis vulgaris) were investigated. Four different metal salts; iron (II) sulfate, copper (II) sulfate, alum and tin (II) chloride, were used to make the dyeing more efficient. At the same time, the fabrics were dyed without any metal salts too. All the dyeing applications were carried out for one hour at boiling temperature. The color efficiencies (K/S) and CIE L*a*b* results of the naturally dyed samples were determined and in addition to this, dyed woolen fabrics were tested in terms of fastness properties too. Consequently, it has been seen that satisfactory colors and fastnesses can be obtained by dyeing the woolen fabrics with barberry shrub branches.

Keywords: Natural Dyes, Woolen Fabric, Green Processing, Barberry, Textile

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TESTING THE EQUISETUM ARVENSE L. PLANT FOR COLORATION OF COTTON FIBERS

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Abstract:

Coloration of textile materials is of great importance to response the demand of consumers. Today coloration of textile materials is most commonly managed by the use of different synthetic dyes. On the other hand different natural sources have been started to be tested again as dye source. In this respect different herbal sources can be used. In this study, Equisetum Arvense L. (horsetail) plant, which is now used for different aims were used for coloring of cotton fibers. Two different cotton based materials “cotton yarns” and “cotton fabrics” were colored with Equisetum Arvense L. in presence of five different metal salts (mordanting agents). These metal salts were designated as CuSO4.5H2O, FeSO4.7H2O, KAl(SO4)2.12H2O, ZnSO4 and K2Cr2O7. By the use of these mordanting agents, it was planned to increase the color efficiency of the dyed samples and to obtain different shades. For the coloration of cotton materials, the dyeing process was set to be one hour at boiling temperature. Subsequently the process was completed by washing and drying of cotton textile materials. The dyed samples were then evaluated in terms of color efficiencies (K/S) and CIE L*, a*, b*, c* and h° values. At the same time, some fastnesses of the dyed samples were tested too. Consequently, it has been found that Equisetum Arvense L. plant can dye cotton fabrics and yarns.

Keywords: Equisetum Arvense L., Color, Mordanting Agent, Cotton, Natural Dye

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DYEING OF WOOL FABRICS WITH AN EXTRACT MIXTURE OF MADDER AND ALKANET ROOTS

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Abstract:

There is a lot of color variety in nature. People are choosing the way to make use of this color variety for different purposes. Textile dyeing also has taken its share of this color variety. In this study, extracts from madder and alkanet roots were obtained and mixed and then this mixture has been used in the coloring of wool fabrics. Meanwhile different from the previous application, a blend with alkanet roots and madder has been prepared afterwards, this blend was taken to the extraction process and this extract has been tested for coloration of wool as well. By this way, it was planned to compare two extraction processes in terms of the obtained colors and to extent the obtained colors and shades. It was observed that by the use of mix extracts, in both ways, different colors can be obtained and this method can be a way to obtain different colors and shades.

Keywords: Madder, Alkanet Root, Wool, Dyeing, Mordant

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DETERMINATION OF FLAME RETARDANT IN VEGETABLE TANNED LEATHERS BY TRI BUTYL PHOSPHATE (TBP)

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Abstract:

There are several methods for tanning leather, but not all of them are the right choice for your health or environment. Chrome-tanning is the most popular and controversial, due to its widespread use in the fashion industry. But the use of chromium salts is harmful to the human and environmental health. Vegetable-tanning is the true "chromium-free" method, and does not have harmful chemicals. In this way leather industry latterly have been increased to use vegetable tannins to be healthier than chrome tanned leathers. In vegetable tanning production, various types of vegetable tannins which are known as hydrolysis and condensation molculer structures, gives to the leathers differents color tone (brown, red brown, yellow brown, red ,etc.). Thus color and light fastness of the vegetable tanned leather can be affected according to their chemical properties. Tributyl Phosphate (TBP) is classified as organophosphorus compounds and shows a fire retardant effect in different materia In this work, TBP was applied to the non-finished vegetable tanned leathers at different concentrations. (0%, 7%, 14%, 21%) After the flame retardant mixture applied to the vegetable tanned leathers, samples were finished with a standard finishing recipe. Fire retardant effect on TBP treated leathers was determined by LOI test. Also morphological properties of leathers by SEM, molecular binding characterization of leathers by ATR+FTIR Analysis and color properties of leathers by CIE Lab Color Fastness Analysis were researched. The results showed that TBP treated vegetable tanned leathers were good flame retardant effect and caused to reduce physical properties in allowable values.ls.

Keywords: Leather, Fire, Flame Retardant, Vegetable Tanned, Tri Butyl Phosphate

[*]This study was financially supported by Istanbul University Scientific Research Project Department Directorate (FYD-2017-24510)

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EVALUATION OF WASTEWATER AND PRODUCED LEATHER QUALITY OF SIMULATED VEGETABLE LEATHER TANNERY USING MYROBALAN TANNIN

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Abstract:

The leather tanning industry originates intensive polluted wastewater containing different kinds of chemicals. These effluents are concern to cause toxicity and endocrine disruption. The most high quality leather is currently produced by treatment of the hide with salts of the mineral chromium. However, vegetable tannins which stabilize the protein structure of the hide and imparts heat stability, enhanced tensile properties, and resistance to microbial degradation, are intensively used at global scale. Main components of vegetable tannis are mostly known to be tannic acid and gallic acid which have been associated to be a stimulator at low concentrations whereas and toxic at higher concentrations in the receiving waters. This study aimed to characterize simulated vegetable tannery wastewater using hydrolized myrobalan tannin. Convetional pollutants, ecotoxicity and polyphenols of wastewater were assessed before and after tanning and re-tanning processes following standart tests. The presence of organics was also followed by UV absorbance profiles. Vegetable leather production procedure was attempted for one-dose of myrobalan tannin and produced leather quality was evaluated according to standard methods. Wastewater characteristics showed that myrobalan contributed a higher organic content to the wastewater than our previous study using mimoza tannin applying the same tannin and retanning procedure. The concentration of gallic acid (hydrolized) in wastewater was measured at very high concentration (5284.4 ppm and 1349.5 ppm after tanning and retanning respectively) compared to mimosa tannin which is a condensed tannin (82.23 ppm and 29.35 ppm after tanning and retanning respectively), containing wastewater. Increased absorbance peak (200-300 nm) in tanning and retanning effluents with respect to pickling wastewater. The effluent toxicity to Daphnia magna was also observed in the effluents of both processes. Leather quality tests showed that the quality was almost the same with the leather produced with mimosa tannage. In conclusion, there is still a need of further study to optimize the tanning procedure for improving the quality of leather and the wastewater which is to be high-strength for conventional treatment.

Keywords: Vegetable Tannery, Myrobalan Tannin, Wastewater Characterization, Leather Quality, Ecotoxicity, Polyphenols

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ESTIMATION OF FLOW SERIES USING DISCRETE WAVELET ANALYSIS AND ARTIFICIAL NEURAL NETWORKS

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Abstract:

In this study, considering daily average flow data for 20 years of Kotum stream in Tatvan country of Bitlis in Turkey, a model based on wavelet transform and Artificial Neural Networks (ANN) was proposed to estimate daily average flows of the stream for future. For this purpose, firstly daily average flows of the stream between 1997 and 2016 were provided from the flow measurement stations of State Hydraulic Works (SHW). Then, a pre-process procedure was defined to estimate the lost points in the data set and to determine outliers. Dis-crete wavelet transform were applied to the data in order to diminish outliers and to produce more general results. In this context, Daubechies (db), Symlets (sym) and Coiflets (coif) main wavelet families were considered. ANN model consisting of one entry, three hidden and one output layers was trained using the daily average flows between 1997 and 2015 and seasonal notations. The data of 2016 were also used to test general performance and reliability of the model. Consequently, the all wavelet families and ANN combinations gave satisfactory results and the best model is coif wavelet family with R2 = 0.78.

Keywords: Flow Series, Discrete Wavelet Transform, Artificial Neural Networks (ANN).

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FLOW SIMULATION IN KOPRU DAM SPILLWAY USING COMPUTATIONAL FLUID DYNAMICS

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Abstract:

Kopru Dam and Hydroelectric Power Plant (HPP) are one of the projects in Turkey which are developed for energy purposes. The facility is located in the border of Adana province, on the Goksu stream of the Seyhan River at the junction of Kavsak Bendi HPP. Kopru Dam and HPP have approximately 145 MW installed capacity and it is aimed to produce 381 GWh of electricity per year. When the current installed capacity is concerned, Kopru Dam and HPP is Turkey's 97th largest power plant. Nevertheless, the facility is Turkey's largest 32nd hydroelectric power plant. Computational Fluid Dynamics (CFD) techniques have been improved recently together with developing computer and computation methods. The use of computational methods with experimental tests provides many advantages in hydraulics and fluid dynamics. In this study, two-dimensional hydrodynamic behaviors of Kopru dam spillway and vent on the spillway will be investigated by using Computational Fluid Dynamics (CFD) under different flow and design conditions. The data obtained will be compared with the model experiments conducted by the State Hydraulic Works (SWW), and discussed.

Keywords: Cfd, Spillway, Numerical Analysis, Kopru Dam.

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SALIVA FASTNESS OF THE NATURALLY DYED FABRICS

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Abstract:

Textile materials have a wide range of uses, and many of them are usually taken by chemical processes prior to use and are presented to the users as colored or affected. But especially for the textile materials will be used for baby wear different demands can come across. In this respect use of natural sources for coloration can be a way if no mordanting agent had been used. This study was aimed to show the usability of the mint in dyeing processes. During dyeing process no mordanting agent had been used. After dyeing process, the dyed samples were then analyzed in terms of color efficiencies (K/S) and CIE L*a*b* color values. The photo of the samples was also taken to show the obtained colors as well. Addition to this, washing fastness, light fastness, rubbing fastness, and perspiration fastness of dyed samples were analyzed. Beyond these fastnesses, the saliva fastness of the dyed samples were also tested which can be also an important parameter for baby wear. As a result, it has been found that the tested natural dye source can be used for the coloration and as with other fastnesses; sufficient results have been obtained in saliva fastness too.

Keywords: Saliva Fastness, Dyeing, Natural Sources, Natural Dyeing

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USABILITY OF ALKALINE PROTEASE ENZYME IN PRETREATMENT OF POLYAMIDE FABRICS

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Abstract:

Pretreatment is an important stage in textile finishing processes and depending on the textile material (fiber type, construction, demanded end use, etc.) the chemicals and processes can be varied. Generally it can directly affect the dyeability/printability of textile materials. Different chemicals can be used in pretreatment stage of textile materials and in this respect enzymes can be found the area of use. In this study, it was planned to investigate the usability of a commercial alkaline protease enzyme in pretreatment of polyamide fabrics. For this aim different recipes, containing alkaline protease enzyme, were tested on polyamide fabrics. These pretreated polyamide fabrics were then dyed with two different acid dyes which were differed from each other in terms of molecular weight and application pH. After the dyeing processes, the dyed samples' colors were measured with a spectrophotometer and the color efficiencies were analyzed. It was observed that the use of tested alkaline protease enzyme prior to the dyeing of polyamide fabrics with acid dyes influenced the color efficiencies of the dyed samples and most generally increased them.

Keywords: Enzyme, Biotechnology, Dyeing, Acid Dyes, Polyamide Fabrics

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STRUCTURAL ANALYSIS OF HISTORIC BITLIS HOUSES

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Abstract:

The historical Silk Road, involves commercial through road networks used especially for economical targets between Asia and Europe. Bitlis is a trade and production city on Silk Road which is in the important period of rich Anatolian history.Historical artefacts are priceless cultural assets which connect strongly the past and the future. In order to convey our historical heritage to the posterity, the involvements to be applied historical structures to know the properties of constructions together forms the first step of the involvements to protect the historical structures.In the historical urban texture of Bitlis, traditional Bitlis Houses which are sample of vernacular architecture, occupies a large area. Natural disasters in the historic Bitlis houses have been damaged due to environmental impacts such as wearing and tearing over time. Structural analyzes of such structures have an important place in order to transfer historical and cultural heritage to the next generations. With this study, the structural analyzes of selected buildings as examples for the historical Bitlis houses have been carried out. Information about both these houses and the damages has been given and solution suggestions have been presented.

Keywords: Structural Analysis, Bitlis, Historical

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EARTHQUAKE RESISTANT WALL MATERIAL PRODUCTION "PUZZLE PUMICE"

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Abstract:

Pumice is widely used as light wall material (briquette and bims) in Bitlis city .The concrete briquettes that obtained from Bitlis basin which has high pumice reserves, have very low earthquake resistances. In this study, information will be given about "puzzle bims" wall material which will be produced by special production method in order to increase earthquake resistance of concrete briquettes. It is aimed to increase the earthquake safety of these wall materials produced from pumice and contribute to building performance in terms of earthquake safety. In terms of shape, the innovative Puzzle bims production is the main subject of studying. The proposes of this study are, to bring in a new generation wall element (Puzzle Bims) to construction sector, to reduce the damage of the walls due to the material properties in the earthquakes and to provide widespread use of material and in this way, contributing to the region and country's economy by expanding the usage areas of the pumice.

Keywords: Pumice, Puzzle, Bims, Wall Material

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BUCKLING ANALYSIS OF BEAMS WITH VARYING FLEXURAL RIGIDITY ON ELASTIC FOUNDATION

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Abstract:

Buckling analysis of beams have become a significant requirement to constitute stable structures. Various approaches have been used to obtain reliable formulations to analyze buckling of beams. In this study, buckling analysis of Bernoulli-Euler Beams with varying flexural rigidity resting on elastic foundation are presented. Critical buckling loads of the beams are determined based on mixed finite element formulation via Gateaux differential. Beams with varying flexural rigidity on Winkler and Pasternak elastic foundations are tested separately in this study. Single linear beam, two beams for increased stiffness and three beams for symmetrically distributed stiffness are analyzed. Different boundary conditions are used with beams on elastic foundations. Fixed-free end, pinned-pinned, fixed-pinned, fixed-fixed support types are used to investigate the value of critical buckling loads. The relationship of critical buckling load values for beams with varying rigidity are presented separately. It is seen that the results obtained in this study are compatible with exact solutions. In addition, the effects of varying rigidity provide distinct stability characteristics to beam on elastic foundations from the results of the comparative study. The results show that, the functionals obtained from this study are very practical for buckling analysis of beams with varying flexural rigidity on elastic foundations.

Keywords: Beam, Buckling Analysis, Mixed Formulation, Rigidity

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STABILITY ANALYSIS OF BEAMS SUBJECTED TO DISTINCT LOADING TYPES ON ELASTIC FOUNDATION

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Abstract:

The analysis of buckling of beams is a significant problem in design of structures. In this study critical buckling loads of beams subjected to different loading types on elastic foundations are determined. Bernoulli-Euler beam theory is used for investigation of beams in this study. The functionals are obtained with using mixed finite element formulation. Gateaux differential is used for formulation of the functionals. Critical buckling loads are obtained for beams on Winkler and Pasternak foundation elastic foundation separately. For this purpose, only axial force, only uniform distributed load and combination of axial point load and uniform distributed load are analyzed. Fixed-free end, pinned-pinned, fixed-pinned, fixed-fixed support types are investigated to obtain critical buckling load of beams. It is seen that, there are certain distinctions between loading types in terms of support types. The relationship of the value of critical buckling load between fixed-free and pinned-pinned supports, pinned-pinned and fixed-pinned supports and fixed-pinned and fixed-fixed supports are analyzed in terms of only point load, only distributed load and combined point and distributed load separately. It is seen that, the functionals obtained from this study are robust for buckling analyze of beams subjected to distinct loading types on elastic foundations.

Keywords: Beam, Loading Effect, Mixed Formulation, Stability

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CAMEL MILK AS A POTENTIAL THERAPY FOR CONTROLLING DIABETES

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Abstract:

Diabetes mellitus (DM) is the most common chronic disease characterized by a high level of blood glucose that results from the failure of the body to produce sufficient insulin (type 1 diabetes) or from the inability to respond properly to the insulin (type 2 diabetes) that has been produced by the pancreas. It is associated with multiple complications such as cardiovascular diseases, kidney failure, blindness, and amputation of lower extremities. Despite nutrition, oral medication and insulin therapy, people with diabetes often prefer alternative therapy. Camel milk is supposed to be a alternative therapy. It contains insulin (52 units/L) and large concentrations of immunoglobulin, lactoferrin, lactoperoxidase, and peptidoglycan recognition protein, which have biological and pharmacological properties. Camel milk insulin resists coagulum formation in the stomach, and is absorbed in the small intestine. Experimental research and most of the human studies indicated that intake of camel milk can have positive effects on glycemic control,by reducing fasting blood sugar, decreasing insulin resistance, and improving lipid profiles among people with diabetes.

In most studies, the recommended dose of camel milk was 500 mL/day which led to improvement of diabetes markers even after 3 months in people with diabetes. Raw camel milk has the ability to reduce blood glucose level by 55% in diabetic rats, compared to raw cattle milk (43%). Camel milk is safe and efficient in improving long-term glycemic control and can provide a significant reduction in the dose of insulin required by type 1 diabetic patients. Potential positive role on diabetes control could be related to the high content of insulin and insulin like proteins that can increase the activity of insulin receptors.

More experimental studies are needed to confirm the superiority and efficacy of camel milk, compared with other milks and alternative treatments for diabetes.

Keywords: Milk, Camel Milk, Diabetes Mellitus, Therapy, Controlling Diabetes

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A STUDY ON SOME PHYSICAL AND CHEMICAL PROPERTIES OF CONCENTRATED YOGHURT WHEY AS AN INDUSTRIAL WASTE

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Abstract:

Strained yogurt is an indispensable flavor of traditional Turkish and Anatolian food culture, and one of its oldest and most important elements. The basic principle of strained yogurt production is to reduce the water content and increase product longevity by removing the serum. It is a traditional product indigenous to Turkey and also called “Suzme” or “Torba” yogurt. According to the traditional method for producing strained yogurt, the initial yogurt is poured into a special cloth bag and stirred; it is then left overnight to strain off the serum. Many types of concentrated fermented milk products are produced to extend shelf-life. Strained yogurt is one of the most consumed concentrated fermented products. In this study, it was aimed to determine the content of some properties that pass to the whey during the strained yogurt production that uses the traditional method in the dairy plants. At the end of the study, it was determined that yogurt whey had, on average, 5.58% total solids, 3.79% lactose, 0.34% fat, 0.80% total protein, 0.61% ash and pH 4.34. In the yogurt serum, the concentration of Ca was 1034,5 mg/kg; Mg, 110,75mg/kg; K, 1512 mg/kg; Na, 417 mg/kg; and P, 718.5 mg/kg. 34 volatile components have been identified in yogurt whey. Acetaldehyde (%15.45) was a predominant volatile compound in yogurt whey, which followed by acetone (%15.58), diacetyl (%8.65) and acetoin (%4.47). Based on the conventional method, the serums obtained in yogurt production are rich in protein, lactose, vitamins, and minerals. Yogurt serum can be used as a supplement in dairy product production and other foodstuffs as a positive way to take advantage of its nutritional content.

Keywords: Yogurt, Strained Yogurt, Yogurt Whey, Chemical Property, Mineral Elements, Aroma Compound

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BIODIESEL PRODUCTION FROM BROWN GREASE

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Abstract:

Brown grease (BG) is a concentrated in grease traps mixture of oils, fats, solids, and detergents left over by restaurants and food industry which is. Accumulation of grease in the sewage collection system may result in pipe fouling, clogging, and sewer overflows. In addition, grease in wastewater can interfere with the operation of equipment in treatment plants and increase the cost of secondary treatment. BG is classified as waste and for this reason, it should be properly processed and disposed.

BG contains vegetable oils and animal fats, which can be converted into biodiesel. The use of biodiesel instead of conventional diesel fuel can reduce emissions of greenhouse gases and other environmental pollutants (ash, soot, sulfates), and therefore protect the environment and improve air quality. All these factors make BG an attractive raw material for biodiesel production. High content of free fatty acids in BG does not allow the use of conventional basic catalysts in the biodiesel production.

Our study is aimed at developing a new approach to production of biodiesel from BG using efficient heterogeneous catalysts. Preliminary results show that biodiesel can be produced from brown grease by esterification and transesterification at room temperature during several minutes using ultrasonic activation under a heterogenic catalyst. These results promise good prospects for further research and elaboration of a scheme for continuous efficient biodiesel production from BG.

Keywords: Biodiesel, Esterification, Transesterification, Brown Grease

[*]*This study is supported by Israel Ministry of Energy and Water Resources*

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THE QUEST FOR BETTER DRESSINGS IN THE TREATMENT OF PRESSURE ULCERS : A NETWORK META-ANALYSIS

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Abstract:

Objective: To evaluate the effect of the various dressing types and topical agents available with the aim of identifying the best treatment choice(s) for pressure ulcer (PU) healing. Design: Systematic review and network meta-analysis. Data source: PubMed, CINAHL, Embase, Web of Science, Scopus, and the Cochrane Central Register of Controlled Trials (CENTRAL). Review methods: Randomized controlled trials that compared the effectiveness of two or more of the following dressing categories: antimicrobial, basic, film, foam, general solutions and pastes, growth factors, hydrocolloid, hydrogel, negative pressure dressings and radiant heat dressings. The proportion of treated individuals whose PUs healed completely was assessed. The outcome was the relative risk (RR) of cure following treatment and we used the generalised pair-wise modelling framework to generate mixed treatment effects against basic dressings, currently the simplest standard treatment. All treatments are then ranked by their point estimates Results: We found that radiant heat (RR 2.11; 95%CI: 1.03-4.34), general solutions and pastes (RR 1.68; 95%CI: 1.21-2.33), and hydrocolloid (RR 1.38; 95%CI: 1.06-1.79) dressings ranked better than basic dressings for healing PU. On the other hand, hydrogel, antimicrobial and foam dressings did no better than basic dressings. GRF, negative pressure and film dressings seem quite effective but the evidence base was sparce and thus inconclusive. Conclusions: Evidence from our analysis supports the use of hydrocolloid or general solutions and pastes in lieu of basic, hydrogel, foam or antimicrobial dressings. More high-quality, independent research about the effectiveness of the dressings within these categories developed in consultation with health professionals, patients, and their carers is urgently needed to define which of the dressings within the categories defined should become the main-stay of therapy.

Keywords: Dressings Pressure Ulcer

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POMOLOGICAL AND PHYTOCHEMICAL PROPERTIES OF SOME EUROPEAN PLUMS (PRUNUS DOMESTICA) HARVESTED AT DIFFERENT STAGES IN MATURITY

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Abstract:

In recent years, people's interest in natural foods is substantially increased. Plum fruit stands out due to the phytochemicals it contains. In our study, it is identified, at which level of the fruit maturity and at which parts these important compounds are more intense. In the research, “Stanley” and “Sugar plum” that were harvested from nine-year-old trees in a commercial Orchard in Tokat, were used. At the different maturity level of fruits from two plum cultivars, physical characteristic (fruit length, width, weight) and biochemical contents of different fruit parts (whole fruit, fruit flesh, peel) were examined. In both varieties, as fruit maturity progress, fruit height, fruit weight, PH, soluble solids content, total phenolic content, total anthocyanin content and antioxidant capacity increase whereas the fruit firmness and titrable acidity decrease. With the ripening of the fruit, the significant increase, particularly in the peel, in the total phenolic compounds, the total antioxidant capacity and total anthocyanin is determined.

Keywords: Anthocyanins, Antioxidant, Fruit Parts, Fruit Maturity, Plum, Phenolics

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EFFECTS OF DIFFERENT DRYING METHODS ON MODELLING AND FINAL QUALITY OF BLACK MULBERRY FRUIT (MORUS NIGRA)

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Abstract:

Fruits; they provide the vitamins and nutrients needed for development of human body and its protection from diseases, and the digestive organs to work well. Black mulberry fruits are also used to prevent or treat many diseases. Black mulberry that is a delicate fruit has a limited consumption as fresh fruit. Therefore, it is generally dried and consumed as fruit juice, fruit wine and marmalade. In this study, black mulberry fruits were dryed with three different methods (oven dryer, sensitive dryer and vacuum oven dryer). Drying air temperature was 50°C in dryers. Drying performance (drying duration, final moisture content), drying kinetics, color analysis, chemical analyses were performed for all drying methods. Fresh samples reached to desired moisture contents in 81-89 hours. To define time-dependent changes in moisture contents, Page, Yagcioglu and Midilli-Kucuk equations were used. The R2 values for all models ranged from 0,9918 to 0,9989. Yagcioglu equation yielded the best estimations. There were not significant differences in “L” brightness values of fresh and 50°C of sensitive dryer. It has been determined that pH values were closer to freshness at high temperature in black mulberry. Based on current findings, it was concluded that 50°C of sensitive drying were suitable for drying black mulberry fruit.

Keywords: Black Mulberry, Drying Kinetics, Mathematical Modeling, Chemical Analysis, Color Analysis

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DYNAMIC CALCULATIONS OF RG–NO+ (X1Σ+) VAN DER WAALS COMPLEXES

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Abstract:

A full three dimensional ab-initio potential energy surfaces are calculated for all rare gases from He to Xe atoms in collision with the ionic molecule NO+(X1Σ+) using the explicitly correlated variant of the coupled cluster method with single, double, and noniterative triple excitations [CCSD(T)-F12] using the correlation-consistent, triple-zeta (cc-pVTZ-F12) atomic basis sets augmented with mid-bond functions and auxiliary basis for the explicitly correlated part. The calculated ro-vibrational energies are compared with previous theoretical and experimental results [1]. Close-coupling calculations of the collisional rotational excitation integral cross sections of NO+ by He, Ne, and Ar are calculated for total energies up to 1000 cm−1 using the new Rg-NO+ potential energy surfaces. The calculated rate coefficients are compared with the available theoretical data in literature. It was found a good agreement between literature and the present results. The present results can be used for some model in astrophysical media to interpret the evolution of the universe.

Keywords: Computational Chemistry, Atom-Molecular Collisions, Inelastic Collisions

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WEAKLY INTERACTING MOLECULAR CLUSTER OF H2 WITH NO+

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Abstract:

Formation of weakly bound molecular complexes is undoubtedly an important phenomenon playing a crucial role in atmospheric chemistry such as formation of aerosols and/or initiation of atmospheric reactions. The nitrosylium ion (NO+) was found in the Earth's upper atmosphere more than three decades ago while its first detection in the interstellar medium was reported very recently. This first detection of NO+ in the cold dense core of Barnard 1-b is an important step in understanding the interstellar chemistry of molecules containing N and O atoms that play a crucial role in the chemistry relevant to life. H2 is the most abundant gas-phase molecule in interstellar clouds. In a theoretically quite different regime, there are also extreme quantum effects evident in the much simpler H2-containing dimer systems, where large-amplitude internal rotation, zero-point motion and tunneling can have dramatic influences on the internal vibration–rotation dynamics.

In this study, we present the calculation of a new global four-dimensional (4D) PES for the ground electronic state of the H2–NO+ collisional system. These four-dimensional PESs,with a fixed NO+ internuclear distance of re = 2.0125 a.u, have been computed using the spin-restricted coupled cluster method with single, double, and non-iterative triple excitations [RCCSD(T)-F12] with a correlation-consistent, triple-zeta (cc-pVTZ-F12) atomic basis sets, extended by midbond functions.

Keywords: Computational Chemistry, Atom-Molecular Interaction, Spin-Restricted Coupled Cluster Method, Basis Set

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SYNTHESIS, PHOTO-PHYSICAL INVESTIGATION AND PH-DEPENDENT HYDROLYSIS KINETICS OF NOVEL 1,8-NAPHTHALIMIDE DERIVATIVE

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Abstract:

Imide derivatives of 1,8-naphthalic anhydride, especially containing donor groups at 4-position, are generally photo-stable materials and have high fluorescence quantum yield which make possible to use them as fluorescent dyes, fluorescent brightening agents, fluorescent metal and anion sensors, light emitting diodes and more [1,2]. To provide development in these areas, it is essential to synthesize their new derivatives and comprehensively investigate of some properties on photo-physics and chemical/photo-stability etc. Here, a novel highly emissive 1,8-naphthalimide derivative containing 2-thiazoline fragment was synthesized via two steps synthetic procedure and well characterized. Then its absorption and emission properties in common organic solvents, metal/pH sensing behaviours and pH-dependent hydrolysis kinetics were systematically investigated to understand the nature of synthesized novel compound. In conclusion, synthesized compound has high fluorescence quantum yield strongly dependent on solvent polarity, basic hydrolysis kinetics (pH=12) and insignificant metal/pH sensing behaviours.

Keywords: 1,8-Naphthalimide, 2-Thiazoline, Fluorescence, Hydrolysis, Kinetics.

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DESIGNING A SIMULATION METHOD FOR FUEL CELL HYBRID POWERTRAIN SYSTEMS IN MATLAB/SIMULINK ENVIRONMENT

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Abstract:

Fuel cells are the one of option from the alternatives for hybrid powertrain systems in automotive industry. A fuel cell (FC) system offers both the cleanest ride in environmental aspect and the long mileage for vehicles. In this paper, a FC system model is designed for a hybrid vehicular system which consists of a battery, a FC stack and its auxiliary equipments, and the model is simulated in Matlab/Simulink environment by using quasistatic approach. A strategy for the energy conversion of the FC system is also developed considering the state of charge (SOC) of the battery. In this model, power outputs of each powertrain component (battery, FC, electric motor, DC/DC converters etc.), SOC of the battery, methanol consumption and CO2 emissions of the FC are calculated for simulation time according to the proposed operational strategy. The results of the simulations shows the general outputs when the system operates as both hybrid and battery alone mode.

Keywords: Fuel Cell, Hybrid Powertrain, System Simulation, Simulink

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COMPARISON OF NUMERICAL CALCULATION AND FINITE ELEMENT ANALYSIS FOR THE DIAPHRAGM SPRING OF A DRY CLUTCH

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Abstract:

Diaphragm spring characteristics are important to determine clutch performance and ride comfort for the vehicles that are equipped with a dry friction clutch. This study presents calculations of diaphragm spring characteristic with numerical and finite element method and comparison the results. Solid model of the diaphragm spring is designed in Unigraphics NX9® and the analysis were carried out by statically with finite element method in Ansys Workbench 18® for the comparison. Analysis of the diaphragm spring was arranged for both assembly and operational processes of the clutch and effect of the deformation of strap link on diaphragm spring position is also considered. Additionally, stress distribution on the diaphragm spring was determined by the analysis according to total spring deflections. The results show good agreement between numerical and analysis solution and it can also be defined as acceptable for the validation without needing experimental study which is more expensive and time consuming method rather than both approaches.

Keywords: Diaphragm Spring, Dry Clutch, Finite Element Analysis

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SALT STRESS: PHYSIOLOGICAL AND MOLECULAR EFFECTS ON BARLEY

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Abstract:

Salt stress is one of the major abiotic stresses led to alterations in physiological and molecular processes associated with plant growth, development and crop productivity. Furthermore, salinity causes ionic imbalance, which results in ionic toxicity, osmotic stress, and generation of reactive oxygen species. However, barley is considered as an excellent model crop in the attempts to understand the mechanisms of salt tolerance by the reason of knowing as the most tolerant cereal. Our studies demonstrated salt stress affects barley at physiological and molecular levels, especially during germination period. The aim of this study is the investigation of physiological, biochemical and molecular responses of a four barley genotypes Hordeum vulgare L. cvs. (Hasat, Beysehir 99, Konevi 98 and Tarm 92) to 150 mM salinity stress during 3 days germination period. Seeds were placed randomly in Petri dishes (9 cm diameter) containing filter paper soaked in (a) only H2O (control), (b) 150 mM NaCl for 72 h. Total RNA isolation were carried out using TriPure® reagent (Roche) from leaf and root samples obtained after 150 mM salt treatment. The results demonstrated root and shoot heights, fresh and dry weights, water content (WC) and protein content were affected by 150 mm salt application. Primary root lengths, seminal root lengths, shoot growth reduced during salt application. In addition, protein content increased, and proline content altered only in Beysehir 99.Moreover, our studies showed salinity effects lncRNAs expression levels on barley. RT-PCR analysis revealed four among five long non-coding RNAs have tended to be down-regulated under salt stress conditions. Furthermore, comparison of four barley varieties showed that there was statistically significant difference between barley varieties ($p<0.05$). These physiological and molecular findings are expected to contribute to understanding of how salt affects barley germination period on different varieties grown under salt stress condition.

Keywords: Salinity, Barley, Long Non-Coding Rnas, Expression Analysis

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FATIGUE LIFE MODEL FOR RC BEAMS STRENGTHENED WITH NSM CFRP

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Abstract:

This paper presents the results of current research on the fatigue behavior of reinforced concrete (RC) beams strengthened with near-surface mounted (NSM) carbon fiber reinforced polymer (CFRP) composites. Most of the proposed fatigue life models have a good prediction within a stress range of 200 MPa to 300 MPa. However, results are scattered at low cyclic fatigue loading. This may be due to the combined failure modes as deboning is the dominate fatigue failure mode at a higher stress range. The collected data indicate that fatigue damage is unlikely when stress variation is lower than 180 MPa for RC beams strengthened with NSM CFRP if the maximum applied stress is not more than 85% of ultimate capacity.

An analytical S-N fatigue life model was developed based on experimental fatigue data of a constant amplitude of tension-tension cyclic loading obtained from recent literature. A hybrid formulation combining exponential and power laws was used to improve the accuracy of prediction in low and high cycle fatigue regions. Muratov's method was used for determining the endurance limit. The predicted and experimental fatigue life was compared and a strong correlation was observed.

Keywords: Fatigue, Near-Surface Mounted (NSM), Reinforced Concrete (RC), S–N Curve

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HEAT TRANSFER ANALYSIS OF TWO-DIMENSIONAL FUNCTIONALLY GRADED RECTANGULAR PLATES WITH TWO NUMERICAL METHODS

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Abstract:

In this work, temperature distributions of two-dimensional functionally graded rectangular plates with different compositional gradient exponents subjected to constant heat flux from one side are presented in two different numerical methods. The first of these numerical methods is the Finite Element Method (FEM) which is widely used in package programs for structural analysis and the second is Finite Difference Method (FDM) which does not lose importance in analytical solution approximation.

In this study, heat transfer analyses of FGPs with different compositional gradient exponents and temperature-independent material properties have been conducted. The temperature-independent mechanical properties of the FGPs are based on the Mori-Tanaka scheme. As the 1 mm plate thickness was much smaller than other dimensions, the temperature in the thickness direction were neglected and a 2-D analyses was conducted. Two-dimensional grading were performed alongx- and y–directions with three different compositional gradient exponents of n, m = 0.1 (ceramic rich compound), 1.0 (linear change was from ceramic rich compound to metal rich compound), and 10.0 (metal rich compound).

Keywords: Heat Transfer Analysis,Two-Dimensional Functionally Graded Material, Finite Element Methods, Finite Difference Methods.

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THERMAL RESIDUAL STRESS ANALYSIS OF TWO-DIMENSIONAL FUNCTIONALLY GRADED PLATES WITH FINITE ELEMENT AND FINITE DIFFERENCE METHODS

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Abstract:

In this study, the thermal-stress analysis of two dimensional functionally graded rectangular plates (2D-FGRPs) are presented using different numerical solution methods. Among these methods, finite difference method (FDM) is still widely used because of the close results of analytical solution in uniformly bounded geometries. The other solution method we have chosen is Finite element method (FEM) which is applied to all geometries and is based on the package programs that make structural analysis.

The FEM analyses were carried out for both temperature-independent material properties. The geometric and material properties of FGMs structure, meshes, loading and boundary conditions were implemented by a code developed in Python language by which was interpreted by ABAQUS/Standard finite element software. The FDM analyses, the temperature is calculated at the next time step using appropriate finite difference equations for the inner points, edges and corners of the plate in the Fourier heat transfer equation. The set of linear equations were solved using the pseudo singular value method. The explicit difference equations of the thermal analysis were coded, solved and post-processed graphically in MATLAB/mathematical software.

Keywords: Two-Dimensional Functionally Graded Materials, Thermal Residual Stress, Finite Element Methods, Finite Difference Methods.

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AN EXPERIMENTAL STUDY ON THERMAL PERFORMANCE OF A TUBE WITH DETACHED TRAPEZOIDAL NOTCHED TWISTED TAPES

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Abstract:

This work pertains to the experimental investigation of the effect of detached trapezoidal twisted tapes on thermal performance in a tube under uniform heat flux condition. The trapezoidal notched twisted tapes were inserted into the test tube with four clearance ratios of (c/D= 0.0714, 0.0535, 0.0357, 0.0178) with a constant twist ratio of y/D=2. The experiments were performed for Reynolds numbers between 5000 and 25000, using air as a working fluid. The variation of Nusselt number (Nu) and friction factor (f) versus Reynolds number (Re) were introduced for the obtained experimantal results. The variation of thermal performance ratios were also presented in order to determine the most effective twisted tape for practical applications. The plain tube results were compared with the works available in literature for confirmation of the experimental technique. Consequently, the results demonstrated that the usage of twisted tapes at smaller clearance ratios yielded an increase in heat transfer rate and pressure loss.

Keywords: Twisted Tape, Thermal Performance, Heat Transfer, Friction Factor

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HEAT TRANSFER AND FLUID FLOW CHARACTERISTICS OF A TUBE WITH TRAPEZOIDAL NOTCHED TWISTED TAPES

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Abstract:

Heat transfer and fluid flow characteristics of a tube equipped with trapezoidal notched twisted tapes were experimentally investigated. The experiments were conducted for five different twist ratios (y/D=2, 2.5, 3, 3.5 ve 4) in the range of Reynolds number from 5000 to 25000. Uniform heat flux was applied to the external surface of the tube wall and the air was selected as a working fluid. The obtained Nusselt number and friction factor values for plain tube were compared with using well known equations given in literature and were seen in good agreement. The tube equipped with trapezoidal notched twisted tapes introduced a remarkable increment on heat transfer and pressure drop in comparison with the plain tube. The obtained results revealed that Nusselt number, friction factor and heat transfer enhancement ratio increase with the reduction of twist ratio (y/D). As aresult, the highest heat transfer enhancement ratio was obtained as 1.530 for y/D=2 at Reynolds number of 5200.

Keywords: Twisted Tape, Heat Transfer, Pressure Drop, Heat Transfer Enhancement

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A NOVEL ELECTROCHEMICAL SENSOR BASED AU@AG NANOPARTICLES FUNCTIONALIZED MULTI-WALLED CARBON NANOTUBES FOR EZETIMIBE DETECTION

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Abstract:

Reduction in the total cholesterol and low-density lipoprotein cholesterol (LDL) decreases the chances of coronary artery disease. Ezetimibe localizes in the small intestine and acts at the brush border, thus inhibits the passage of dietary and biliary cholesterol across the intestinal wall. Several methods have been reported for the determination of EZE alone or combination with statins in biological fluids and in pharmaceutical dosage forms including chromatography, spectrophotometry, micellar electrokinetic chromatography (MEKC). Carbon nanotubes (CNTs) are allotropes of carbon with a cylindrical nanostructure. These cylindrical carbon molecules have unusual properties, which are valuable for nanotechnology, electronics, optics and other fields of materials science and technology. Core–shell nanoparticles (CSNs) are a class of nanostructured materials that have recently received increased attention owing to their interesting properties and broad range of applications in catalysis, biology, materials chemistry and sensors. In this report, a novel electrochemical sensor based on Au@Ag nanoparticles functionalized walled carbon nanotubes for ezetimibe detection was developed. The developed surfaces were characterized by various techniques. The linearity range and the detection limit were obtained as 0.1 – 10.0 nM and 0.02 nM, respectively. The developed electrochemical sensor was applied to the drug samples for the determination of ezetimibe.

Keywords: Carbon Nitride Nanotubes, Detection, Electrochemical Sensor, Ezetimibe,

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TIO2 NANOPARTICLE/POLYOXOMETALATE DECORATED CARBON NITRIDE NANOTUBES FOR PHOTOCATALYTIC DEGRADATION OF CHLORPYRIFOS

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Abstract:

Chlorpyrifos is widely used to control pest insects in residential, agricultural, and commercial applications. Its common use has led to the release of chlorpyrifos into sediments, wastewater and water sources. The presence of chlorpyrifos in wastewaters and water sources may affect significantly ecosystem and human health due to its chronicle toxicity to aquatic organisms. In this study, TiO2 / polyoxometalate (POM) decorated carbon nitride nanotubes (C3N4 NTs) was prepared and used for investigating the photodegradation of chlorpyrifos. The nanocomposite was characterized by using transmission electron microscopy (TEM) , X-ray photoelectron spectroscopy (XPS) , X-ray diffraction (XRD) and scanning electron microscopy (SEM). In photocatalytic degradation of chlorpyrifos experiments, the effect of operating variables such as initial chlorpyrifos concentration, catalyst dosage and contact time was also investigated. The photocatalytic degradation of chlorpyrifos followed the pseudo – first - order kinetic model. The results indicated that the nanocomposite exhibited a high efficient photocatalytic activity on the photodegradation of chlorpyrifos.

Keywords: Photocatalysis, Nanoparticles, Polyoxometalate, Carbon Nitride Nanotubes, Chlorpyrifos

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MOLECULAR CHARACTERIZATION OF MICROMONOSPORA STRAINS ISOLATED FROM SAKARYA RIVER SEDIMENT

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Abstract:

Micromonospora type genus that belonged to Micromonosporaceae family was first described by Ørskov (1923) and its systematic structure was redescribed by Gao et al. (2014). Members of the genus Micromonospora could be isolated from different habitat such as soil, rhizosphere and marine sediment (Veyisoglu et al., 2016). Taxonomic position of Micromonospora isolates obtained from Sakarya River sediment was determined by 16S rRNA sequence analysis in the present study. Sediment collection was conducted from different locations such as source water outlet point, plant rhizosphere and open field sediment of Sakarya river in Cifteler, Eskisehir. Sediment samples from 4 different points utilized in selective isolation procedures, sucrose centrifugation gradient and dilution plate technique were among them. SM3, starch-casein agar, ISP1, ISP2, Bennett agar and tripton yeast extract agar were used as selective isolation medium. Plates were incubated at 28°C for 6-8 weeks.

Phylogenetic analysis of 16S rRNA gene sequences showed that isolates had been closely related to Micromonospora genus in the range of 90.76-99.57% resemblence. Micromonospora sp. coded as S1G21, S2G33, S2G35 and S1G34 had 98.51% relationship with M. vinacea. The highest 16S rRNA sequence similarities between S3S31, S1S34, S1S33 and S1S31 isolates and type strains of recognized species in the databases were 97.34-99.16% (38-12 nt differences) to M. spongicola. 16S rRNA sequences of S2S31, S2S22, S2S23, S1S21, S1S23 and S1S35 isolates revealed close similarity (between 90.76-99.43% ; 130-8 nt differences) with type strain of M. ovatispora.

Based on nt differebces, S2G33, S1G34, S1S34, S1S33, S1S31, S1S35, S2S31, S1S23, S2S22 and S2S23 isolates were identified as candidates of possible new species. Polyphasic methods used for their numeric, molecular and chemotaxonomic character identification will be performed in the near future.

Keywords: River Sediment, Selective Isolation, Micromonospora, 16S Rrna

[*]*Bilecik Seyh Edebali University (Project no. 2016-01.BSEU.13-01)*

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MOLECULAR IDENTIFICATION OF RHODOCOCCUS STRAINS BY 16S RRNA GENE SEQUENCES ANALYSIS

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Abstract:

Rhodococcus genus belongs to order the Nocardiaceae family and this genus includes pathogenic and non-pathogenic members. Pathogenic members of the genus Rhodococcus can cause infections such as pneumonia and septicaemia in humans, animals and plants. Rhodococcus have recently been isolated from different sources such as soils, rocks, boreholes, groundwater, marine sediments and from healthy and diseased humans, animals and plants (Jones et al., 2013). In the present study, it was aimed to determine taxonomic position of Rhodococcus isolates by 16S rRNA sequence analysis. Soil samples obtained from agricultural land were collected from from certain regions situated in Prague, Czech Republic; Vienna, Australia. Soil samples were dried and decontaminated prior to isolation which was achieved by dilution plate technique. SM3, glucose yeast exstract agar, Bennett agar and tripton yeast extract agar were utilized as selective isolation media and isolated were incubated at 28° C for 6-8 weeks.

Phylogenetic analysis of 16S rRNA gene sequences indicated close relation with Rhodococcus genus. Rhodococcus sp. KSC20 and VYN29 had 98.76 and98.01% relationship to R. jostii, with 17-26 nt differences, respectively. Although these two organisms were related to the same type strain, their were location in the phylogenetic tree was found to be different. While VYN29 could exist in different branch with R. percolates and R. opacus, KSC20 was located in the same branch with R. jostii.

We have determined KSC20 and VYN29 isolates as candidates of new species. Their identification using polyphasic methods will be performed in the near future.

Keywords: Agriculture Soil, Rhodococcus Sp., 16S Rrna.

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FINANCIAL ANALYSIS OF THE SOLAR ENERGY PLANT ESTABLISHED IN KONYA USING THE PRODUCTION DATA

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Abstract:

Electricity is widely used in every area due to its superior characteristics such as being easy to carry around, being environmentally friendly and cheap. Today, global warming is seen as one of the most important problems that affect climate change in the world and should come from the supremacy of humanity in the future. Global warming is seen as one of the most important problems that affect climate change on earth today and must come from the top of humanity in the future. As one of the causes of global warming, it is caused by greenhouse gases that are released into the atmosphere as a result of oil and coal-based resources used in the transportation vehicles and production of electric energy. Countries are creating policies to control greenhouse gas emissions and encourage the use of renewable energy sources. It is aimed to increase the share of renewable energy sources in total energy supply to 30 % by 2023 in Turkey. In order to support electricity generation from solar energy in Turkey and to increase the number of Solar Energy Power Plants to be installed, it is allowed to install power plants without licenses up to 1MW. The electricity generated in renewable solar power plants in Turkey is taken from 13.3 cents under 10 year's Turkish government guarantee. The owners of capital to invest in solar energy want to know what period of investment costs will return and what the profitability rates will be. The owners of capital to invest in solar energy want to see in what period the investment costs will return and what the profitability rates will be on the actual data. With this study, it is aimed to provide information to the investors who will invest to generate electricity from solar energy, and to provide resources for the profitability of the investment which they think to make. For this purpose, the estimated return period of the investment costs was tried to be calculated through the production data of 1 MW and 0,7 MW power plants established as unlicensed in Konya Region. The development and growth that will be achieved when energy investments are directed towards renewable energy-based technologies will lead to a reduction in the future use of electricity energy costs and consequently to a reduction in the negative impacts on the environment.

Keywords: Solar Panel, Financial Analysis, Inverter, Electricity Generation, Cost

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REALIZATION OF GREEN HOUSE AUTOMATION WITH PLC BY USING INNOVATIVE SENSORS

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Abstract:

In some regions of our country, the winter season is lighter than the other regions in terms of climate conditions. It is very suitable for the production of agricultural products with the aid of greenhouses established in these regions. The climate conditions in the greenhouse can be controlled by sera automation in these regions. In this study, an automation system was designed to ensure that the environmental conditions of the greenhouse are in the required form, taking into consideration the outdoor climate conditions. With this control system, it is possible to control the heating, cooling, irrigation, ventilation system for the setting of the greenhouse environment in accordance with the product type in the greenhouse. These parameters are adjusted accordingly and the appropriate climate conditions for the plants in the greenhouse are set. Since the climate conditions are controlled so that the development of the plant is continued, it is aimed to complete the continuous and healthy development of the plant. With the improved sera automation, the product is in the desired quality and product yield is increased. With this automation realized, it was understood that banana harvest could be realized twice in the year in the greenhouses in the Mediterranean region. In this work, PLC, HMI, temperature, humidity sensor and wind sensor are used to realize sera automation. The water used in the greenhouse water is supplied from the pre-stored solar collector by preheating.

Keywords: Greenhouse Automation, Solar Collector, PLC, HMI, Sensor

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A STUDY ON USAGE OF URBAN PARKS: CASE OF PAMUKKALE-DENIZLI, TURKEY

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Abstract:

In the study, usage of parks in Pamukkale-Denizli, Turkey is determined through a face-to-face questionnaire survey with 100 respondents. 52% of respondents live in Pamukkale county for more than 10 years. The majority of them come to parks with their family and children for playgrounds on foot in all seasons which weather is warm and visit the parks several times a week and spend 1-2 hours for every visit. They mostly prefer Camlik park within the boundaries of Pamukkale county. The cleanliness, safeness and lighting of the parks are found to be inadequate by more than half of the respondents. Half of them think that the number of playgrounds are not adequate in the neighborhood where they live. 44% of respondents state that buffets and cafes around parks have a positive impact on their visit to parks. The majority of visitors consider that trash bins, seating equipment and playgrounds in the parks are inadequate. They would like parks with particularly playgrounds and seating equipment. 59% of the respondents, 62% of whom are female, play sports (mostly walking) in the parks. As considered all results, the cleanliness, safeness and lighting of the parks should be improved by the relevant groups and additionally the furniture deficiencies must be completed as soon as possible.

Keywords: Furniture, Pamukkale, Park, Respondent

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DETERMINATION OF CURRENT SITUATION IN VOCATIONAL HIGH SCHOOL GARDENS: A CASE OF CIVRIL-DENIZLI, TURKEY

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Abstract:

Despite the fact that school gardens play important role for helping students develop physical, social, cognitive, and emotional skills they have been generally overlooked. This study examined current situation in vocational high school gardens in Civril county of Denizli, Turkey based on landscape design principles. For this purpose, general information, school entrance and equipment element, sport areas, furniture, parking lots, areas for education and socio-cultural activities of four vocational high school were evaluated in terms of their adequacy. In general, Beycesultan Vocational and Technical Anatolian High School out of four schools was from the standpoint of most design principles. On the other hand, Kadir Kemeroglu Vocational and Technical Anatolian High School was the most inadequate among the studied schools. Sport areas, seating equipment and parking lots were inadequate in nearly all schools studied. In conclusion, improving conditions of school gardens with the help of educators, spatial planning and design experts and local community would contribute to the youths' physical and psychological development.

Keywords: Denizli, Landscape Design, School Garden, Vocational High School

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EFFECTS OF DISTANCE FROM CRATER CENTER ON SOME SOIL PROPERTIES IN MEKE MAAR CRATER LAKE IN SEMI-ARID REGION OF TURKEY

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Abstract:

The aim of this study is to determine effects of distance from crater center on some soil chemical and physical properties in Meke Maar Crater Lake where is in semi-arid region of Turkey in Inner Anatolia. Three different distances from crater center were used for soil sampling. They were sorted as Center crater (CC), Crater Lake (CL) next to crater center and adjacent area (AA) next to Crater Lake. Soil samples collected from the topsoil 0-20 cm depth from 15 sampling plots on each area and they were used to determine soil texture, reaction (pH), electrical conductivity (EC), cation exchange capacity (CEC), calcium carbonate (CaCO3), inorganic carbon (IOC), organic matter (OM) and organic carbon (OC) contents.

Texture of soil was in generally loamy sand where it ranged from clay to sandy soil in this area. All measured soil properties including CaCO3, IOC, OM, OC contents, CEC, pH, EC, the percentage of sand, clay and silt were significantly different among the sites. CaCO3, IOC, OM, OC, CEC, pH and percent of clay were 63%, 63%, 90%, 90%, 65%, 65%, 9% and 80% less on AA sites and 66%, 66%, 61%, 61%, 45%, 45%, 9% and 84% less on CC sites than those on crater lake sites respectively. EC were 90% and 77% less on the CL and AA sites than those on the CC sites respectively. Percent of sand on the CL sites were 39% and 34% less than those on the CC and AA sites respectively. Percent of silt were 38% less on the AA sites than those on CC sites.

Keywords: Crater Lake, Semi-Arid Region, Soil

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VARIATION OF NITROGEN CONTENT IN BEECH-CHESTNUT MIXED FORESTS' TREES ACCORDING TO DIAMETER AT BREAST HEIGHT IN WESTERN BLACK SEA REGION OF TURKEY

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Abstract:

The aim of this study is to determine the ratio and amount of Nitrogen (N) depends on biomass of below- (root) and aboveground (stem, branch, bark, leaf) of trees with different diameter at breast height (DBH) and height in beech (Fagus orientalis Lipsky) and chestnut (Castanea sativa Mill.) mixed stands in the Duzce-Akcakoca region where represents coastal region of Western Black Sea. Study sites where is in Euxin subregion of Euro-Siberian Floristic Region have been chosen from Kaplandede mountain in Chieftaincy of Deredibi Forest Management where is a part of Directorate of Akcakoca Forest Management, Bolu Regional Directorate of Forestry organization. The mean annual temperature is 12°C and mean annual precipitation is 900 mm. Soil texture is generally loamy and soil reaction is acidic with a 5.5 mean soil pH. The content of N were calculated from 24 beech and 24 chestnut trees. Although the highest ratio of N was on tree leaves and the lowest was on stem wood, the highest amount of N was on roots and the lowest amount was on bark for both beech and chestnut trees. Depending on the diameter, regression equations were created that can calculate N amounts of all tree components (branch, leaf, stem and root) as well as the total amounts. The regression equations for the total N amount of beech and chestnut were N=0.1083DBH-1.2855 (R2=0.9116) and N=0.0717DBH-0.8435 (R2=0.7551), respectively. These values can be both used in future climate change related C calculations and field efficiency related for sustainable management nutrient-calculations for the region. Knowing only the diameter of the tree, practitioners and researchers will be able to calculate N values easily in a very large area. In addition, these data may be stored as long-term information for the region.

Keywords: Beech, Chestnut, Biomass, Nitrogen.

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THE PROPERTIES OF ICE CREAMS ENRICHED WITH SOME DIETARY FIBERS

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Abstract:

Dietary fiber (DF) is a remnant of the edible part of plant; it is analogous carbohydrates that are resistant to digestion and absorption in the human small intestine and undergo complete or partial fermentation in the human large intestine. DF plays an important role in human health. High DF diets are associated with the prevention, reduction and treatment of some diseases, such as diverticular and coronary heart diseases. This has prompted efforts to add DF into food products. Food developers use isolated fiber ingredients for their functional properties such as solubility, viscosity and gelation forming ability, and water, oil, mineral and organic molecule-binding capacities. The by-products of fruits from industrial applications are potential sources of DF that can be incorporated into food products. DFs from cereals are used more frequently than those from fruits; however, fruit fibers are of better quality due to their higher total and soluble fiber content, water and oil holding capacity and colonic fermentability, as well as their lower phytic acid contents and caloric values. In addition, fruit fibers have significant amounts of secondary compounds associated with them, such as polyphenols with high biological activity and other bioactive compounds. The aim of this study was to determine and compare the effects of apple, lemon and wheat fibers addition on the physical, chemical and sensory properties of ice cream samples. For this purpose, seven different ice-creams were produced and physico-chemical and sensory properties of ice-creams were determined.

The type and the rate of fibers had statistically significant effect on the physico-chemical and sensory properties of ice-creams. Results showed that apple, lemon and wheat fibers can be used successfully in the production of ice cream. The physico-chemical and some sensory properties of ice-creams with fiber were better than control sample.

Keywords: Ice Cream, Apple Fiber, Lemon Fiber, Wheat Fiber

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THE EFFECTS OF ENCAPSULATED PROTEASE AND LIPASE INTO GELLAN ON THE TEXTURAL AND ORGANOLEPTICAL PROPERTIES OF KASHAR CHEESE

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Abstract:

Kashar cheese is the most commonly produced and consumed cheese in Turkey, the Balkan Peninsula and the Mediterranean region after white cheese. The main problem in manufacturing Kashar cheese is the long maturation period, which increases the cost of handling significantly. Several attempts have been made to reduce the ripening period by the addition of individual and mixed lipase, protease and β-galactosidase enzymes, some of which have been reported to halve the normal maturation period of cheese. The addition of free lipase or protease has resulted in premature attack leading to excessive lipolysis, proteolysis and texture and flavour defects. The use of microencapsulated enzymes has been proposed to improve these drawbacks.

In tis study, lipase, protease and the mixture of them were encapsulated in gellan and added to Kashar cheese milk to accelerate cheese ripening. The effect of encapsulated enzymes on the textural and organoleptical properties of the cheese was investigated during 180 days storage.

According to the result, the best cheeses were obtained with encapsulated protease. So usage of encapsulated protease into gellan for Kashar cheese production could be recommend.

Keywords: Kashar Cheese, Encapsulation, Lipase, Protease, Texture

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A STUDY ON DETERMINATION OF THE CRUSTAL DENSITY OF THE ATMOSPHERE-CRUST INTERFACE FOR THE CENTRAL ANATOLIA BY USING THE FRACTAL DIMENSIONS

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Abstract:

The aim of this study is to estimate the optimum density of Bouguer correction which minimizes the topographic effect for the central Anatolian gravity data set comprising an area of 315×315 kms in size. Here, the methodology of fractal derived minimization of the roughness of the Bouguer anomaly surface is used for determine a crustal density value at the atmosphere-crust interface for the Bouguer reduction. Fractal dimensions indicate how much the topographic effects is contain within the gravity data. For this purpose, various simple Bouguer gravity anomalies were computed by extracting the bouguer slab formula for different densities between 2.2 to 3.0 g/cc at 0.1 g/cc intervals from the free-air anomalies. Then the fractal dimensions have been calculated for each from the slope of their radially averaged log power spectrums. The plot of the fractal dimensions versus densities shows decreasing fractal dimensions with increasing densities. Thereafter, the residual fractal curve was obtained by fitting a least squares linear to the plot and extracting the actual values from them. The residual curve showing an U-shaped trend gives its minimum value at the density of 2.58 g/cc. This density corresponds to the best crustal density at atmosphere-crust interface which minimizes the topographic effect from the free-air gravity anomalies of the central Anatolia region.

Keywords: Crustal Density, Fractal Dimensions, Bouguer Correction, Central Anatolia

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DISTRIBUTION OF MAGNETIC SUSCEPTIBILITY IN THE BODRUM PENINSULA AND ITS VICINITY, TURKEY

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Abstract:

The field covering the study area is located in the southwest part of Turkey and it covers an area of approximately 300 km2. The field is represented Teke Nappes and outcrops of different rock types in the region. In this study, we determined distribution of magnetic susceptibility of rocks located in the field. For this aim, the region was investigated under two sub-regions as Bodrum Peninsula and the eastern side of Bodrum peninsula and magnetic susceptibility measurements were taken a total number of 140 sites using magnetic susceptibility meter. In Bodrum Peninsula, Teke nappes form the basement rocks are characterized by magmatic rocks such as latite-andesite association which includes latite-andesite, basaltic andesite, rhyolite, pyroclastic rocks, mafic and felsic dykes, lavas whereas the eastern part of Bodrum Peninsula is characterized by metamorphic rocks of the Menderes massif such as schist, calc- schist, marble, cherty marble. With examination the measurement results, it is seen that high magnetic susceptibility values (0.97×10-3) were measured in Bodrum Peninsula. Andesite units are in the class of magmatic rocks and they have higher magnetic susceptibility than metamorphic and sedimantary rocks. So; the high values are good agreement with andesite units located in Bodrum Peninsula. The other high values are observed in the eastern side of Bodrum Peninsula and correspond to marble and cherty marble units.

Keywords: Susceptibity, Bodrum Peninsula, Magnetic

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DESIGN OF PID CONTROLLED-AUTOMATIC VOLTAGE REGULATOR SYSTEM BASED ON A NEW NEIGHBORHOOD STRATEGY OF SIMULATED ANNEALING

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Abstract:

In an electric power station, automatic voltage regulator (AVR) should have good dynamic response to ensure a constant voltage for healthy operation of equipment connected with this power station. Besides, it is a system that significantly influences the power quality, grid security and grid reliability as well. Since it is, therefore, great interest to enhance the performance of an AVR system, we are motivated to deploy a new genetic algorithm-based simulated annealing (GASA) algorithm in the hope of exploring better gains of PID controller installed in an AVR. To highlight the superiority of our proposal, comparisons are made with a number of studies published in esteemed journals for the identical AVR system using transient response analysis. Comparative analysis results demonstrate that GASA-tuned PID controller exhibits a better voltage response profile than its competitors in a sense that the system output settles to the given step reference with less settling time and peak overshoot.

Keywords: Automatic Voltage Regulator, PID Controller, Multi-Objective Optimization, Simulated Annealing, Genetic Algorithm, Neighborhood,

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TREATMENT OF INDUSTRIAL WASTEWATERS WITH ANAEROBIC MEMBRANE BIOREACTORS

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Abstract:

Anaerobic membrane bioreactors (AnMBR) are wastewater treatment systems with a great potential which has not yet been utilized to its full extent. Membrane bioreactors alone offer significant advantages over conventional activated sludge systems (CAS) - such as low footprint, low sludge production and high treatment efficiency. When compared to aerobic MBRs, AnMBRs offer some additional benefits, the most important being the ability to produce biogas. Additionally, these systems are able to operate under a higher organic loading rate (OLR) and provide important cost savings since aeration is not required. On the other hand, AnMBRs have a higher fouling propensity and hence are generally operated at a lower flux. Research in this technology has experienced an increase in the last two decades, whereby AnMBRs have been utilized for the treatment of a variety of wastewaters and with a focus on different aspects of their operation - mostly treatment efficiency, membrane fouling or biogas production. The advance from lab-scale to pilot- and full-scale systems has been identified as needing special focus in the future. Membrane fouling and its effects on the operation of AnMBRs are the main obstacles that need to be overcome in order for these systems to become widespread. This study offers an overview of the applications of AnMBRs in the treatment of various types of industrial wastewaters, together with its advantages and challenges that need to be addressed in the future.

Keywords: Industrial Wastewater, Biological Treatment, Anaerobic Membrane Bioreactors, Membrane Fouling

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MEMBRANE BIOREACTORS APPLICATION IN TEXTILE WASTEWATER TREATMENT

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Abstract:

Textile industry is a significant consumer of dyes, with around 50% of dyes produced in the world being textile dyes. Since dye retention is generally less than 50%, most of them are discharged with the wastewater. Such dye-rich textile wastewater is both esthetically unpleasant and harmful to the environment. Current treatment methods most often involve physical/chemical pre-treatment in addition to conventional activated sludge (CAS) treatment in order to achieve the stipulated effluent values. This in turn produces chemical sludge which itself requires proper disposal. Membrane bioreactor (MBR) systems offer better treatment efficiencies combined with a lower sludge production and reduced footprint. Many studies have explored aerobic MBR systems and have reported sufficient COD removal, but insufficient color removal. The most probable cause is the fact that aerobic conditions do not allow for the cleavage of azo-dye molecules, the most common type of dye used in the textile industry. Hence, studies utilizing anaerobic MBR (AnMBR) systems alone or in combination with aerobic MBRs reported satisfactory color removal efficiencies. Additionally, in order to lessen the effect of the commonly encountered fouling problems characteristic for MBRs, some studies applied dynamic MBR (DMBR) systems, which enable higher fluxes together with lower fouling rates. This study offers an overview of the applications of different MBR systems in the treatment of dye-containing textile wastewaters, their advantages and drawbacks as well as perspectives for the future.

Keywords: Textile Wastewater, Biological Treatment, Membrane Bioreactors, Membrane Fouling

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DETERMINATION OPTIMUM MACHINING PARAMETERS OF NICKEL BASED SUPER ALLOY

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Abstract:

In this study, optimum cutting conditions were determined by calculating the machining parameters of Incoloy 901 nickel-based superalloy with different ceramic cutting tools. The effect of machining parameters on average surface roughness and main cutting force determined by Taguchi experimental design L18 orthogonal array and S/N (signal/noise) ratios with "smaller is better" approach by calculating variance analysis (ANOVA). The effects of turning parameters on both average surface roughness and cutting forces using ceramic cutting tools 4300, KYS 25 and KYS 30 were determined. Fz cutting force was taken as the criterion for the main cutting force and the lowest main cutting force were obtained with KYS25 and the lowest average surface roughness were obtained with the KYS30 ceramic cutting tool depending on the cutting tool material. In the experiments, the effect of the feed rate on the cutting force measurements was more significant, while the effect of the cutting speed was more pronounced in the surface roughness tests.

Keywords: Machinability, Optimized By Taguchi Design Of Experiments, Incoloy 901, Surface Roughness, Cutting Forces

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ANALYSIS OF THE POSITIONING PERFORMANCE OF BEIDOU

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Abstract:

BeiDou Navigation Satellite System (BDS) is planned to provide global navigation service in 2020. Currently, as of 01.02.2018, a total of 15 BeiDou-2 satellites are operational, including 6 Geostationary Orbit (GEO, PRN: C01-C05, C17), 6 Inclined Geosynchronous Orbit (IGSO, PRN: C06-C10, C13) and 3 Medium Earth Orbit (MEO, PRN: C11, C12, C14). By the help of BeiDou-3 satellites which are not operational yet, BDS can provide global coverage in the near future. In this study, positioning performance of BDS was examined using medium (~892 km) and long (~2173 km) baselines. For doing this, 10 daily datasets (10.05.2017-19.05.2017) were processed using GAMIT GLOBK scientific software and derived coordinate results were compared with the results of Global Positioning System (GPS). The results show that coordinate differences between BeiDou and GPS are generally better than 1 cm for the medium baseline in both horizontal and vertical directions. However they reach larger level for the long baseline (from 2 cm to 10 cm) in all components.

Keywords: Beidou, Gps, Geo, Igso, Meo, Positioning

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DATE2GPSWEEK SOFTWARE

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Abstract:

This paper introduces a software which compute the Julian day number, day of the year (DOY), Global Positioning System (GPS) week number and measurement epoch from the date (year-month-day). These conversions are very useful especially downloading the receiver independent exchange format (rinex) and precise ephemerides files. Name of the rinex files are created with respect to DOY number. For downloading any ephemerides file from IGS or other institutions, GPS week number should be known. The time difference between the reference epoch and measurement (survey) epochs should be known for coordinate displacement with respect to the velocities of the stations which is required to transition between kinematic datum to static datum. The software was written in MATLAB programming language. The graphical user interface (GUI) was created for convenience of the users. The source codes (m file) and GUI file (fig) can be requested from the authors' official e-mails. The authors consider to develop this software in terms of functionality which allows more than one date input in the future. In this way, users can read the date inputs once and the conversions can be occurred sequentially for each date input.

Keywords: GPS Week Number, DOY, Julian Day

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THE EFFECTS ON HEMATOLOGICAL AND IMMUNOLOGICAL PARAMETERS OF AEROMANAS HYDROPHILA INFECTION IN RUSSIAN STURGEON (ACIPENSER GUELDENSTAEDTII) FED WITH ECHINACEA PLANT (ECHINACEA ANGUSTIFOLIA)

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Abstract:

In the research, some haematological and immunological parameters were identified against Aeromanas hydrophila infection in Russian Sturgeon (Acipenser gueldenstaedtii Brandt & Ratzeburg, 1833) fed with diets containing different ratios of Echinacea angustifolia used as immunostimulant. The aim of the study is to determine the optimal dose of the echinacea plant which is a natural immunostimulant to be added into the fish feed. After the fishes have been fed with diets containing different rates of echinacea plant, values of TNF-α, IFN-γ, IL-1, IL-6, IL-8, erythrocyte, leukocyte, lymphocyte, monocyte, eosinophil, neutrophil, basophil, hematocrit and phagocytic activity were calculated. Experimental infection was created with Aeromanas hydrophila in Russian sturgeons, fed with rations of 0%, 5%, 10%, 15% milled echinacea plant mixed feeds. Experimental groups fed with diets containing echinacea at the rates of 5% (Group 1), 10% (Group 2) and 15% (Group 3) were constructed in a total of 150 fishes with three repetitions as positive (4th group) and negative (5th group) control groups. 4x106 cfu/ml Aeromanas hydrophila inoculum was injected intraperitoneally into a total of 120 fishes in groups of 10 in 12 tanks in an amount of 0.1 ml, which was determined as an appropriate dose to create an experimental infection. On the 5th day after injection, hematological and immunological examinations were made by taking 10 samples from control and infected fish. Hb, Hct and RBC values were increased in Group 3 and Group 5 compared to Group 1, Group 2 and Group 4. WBC number increased in the 4th group according to the other groups ($P<0.05$). Monocyte counts increased in group 3 compared to the 1st, 2nd, 4rd and 5th groups, lymphocyte count was increased in the 1st, 2nd, 3rd and 4th groups according to 5th group. Highest increase in the lymphocyte counts occurred in the Group 2 and 3 ($P<0.05$). An increase in percentage of neutrophils was found when compared with the other groups (1st, 4th groups) in groups 2, 3 and 5. No change was detected between the groups at eosinophil level. Phagocytic activity level was increased at the 3nd group when compared to the other groups. TNF-α and IL-8 levels were increased in the 1st, 2nd, 3rd and 4th groups according to 5th group. Highest increase in the TNF-α and IL-8 levels occurred in the Group 3 ($P<0.05$). There was an decrease in IL-1β and IL-6 levels in the 1st, 2nd, 4rd and 5th groups compared to the 3th group. IFN-γ in 1st group was determined a increase compared to 2nd, 3rd, 4th and 5th groups ($P<0.05$). Consistering to the result of our research, feeding with feed containing 10% and 15% echinacea plant ratio were stimulate to non-specific immunity against Aeromanas hydrophila infection. The best immune stimulation is thought to be obtained at the rate of 15% echinacea.

Keywords: Acipenser Gueldenstaedtii, Aeromanas Hydrophila, Echinacea Angustifolia

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INVESTIGATION OF AFLATOXIN IN FEEDS USED IN TWO RAINBOW TROUT OPERATIONS IN ADANA AND AGRI PROVINCES IN DIFFERENT CLIMATIC CONDITIONS

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Abstract:

This study is aimed to determine the presence of aflatoxin, which is expected to increase in fish feeds between May-August 2017 periods, in stocks of rainbow trout farms in Adana and Agri provinces and to study the aflatoxin presence in feeds kept in two different climatological environments. During the study period were recorded drought conditions according to the standard 3-month rainfall index of Turkey. According to our records, Adana province was slightly dry and humid, Agri province was moderate in May-July. The fish feeds which constitute the material of the research were supplied by passing a black bag in addition to these in order to avoid exposure to the sun in quantities of at least 500 grams from two separate trout farms in Adana and Agri provinces during the summer period of May-August. Sample purchases were made by homogeneously mixing the original packed bags.

Information on feed samples is noted as written in original feed sachets. The analysis of feed samples was carried out in laboratories affiliated to the Provincial Directorate of Agriculture, Animal Husbandry in Adana. Aflatoxin analysis was performed according to IAC-HPLC-FD and the detection limit of this method was determined as 0.2 ppb. We found that in the May-August 2017 period, the aflatoxin ratio of fish feeds on both sides did not exceed 0.2 ppb.

Keywords: Adana, Agri, Aflatoxin, Oncorhynchus Mykiss, Trout Food

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DETERMINATION OF PARASITIC TRANSMISSIONS BETWEEN JAPANESE FISH (CARASSIUS AURATUS, GOLDFISH) AND TOADS (RANA RIDIBUNDA, RANA VIRIDIS)

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Abstract:

This research conducted ectoparasite scans from frogs (Rana ridibunda, Rana viridis) caught from the same pool as Japanese fish (Carassius auratus) reared in Dr. Nazmi TEKELIOGLU's Freshwater Fish Production Facilities of Cukurova University Faculty of Fisheries between April 1 and July 1, 2016. Ectoparasite examinations were performed on a total of 120 fish and 60 frogs 6 times every 15 days. For these examinations, fresh preparations were made using Klein's Silver Impregnation method. Frogs (Rana ridibunda, Rana viridis) residing in the water were examined using the same method. The chosen period of study was tailored to when the larvae of frogs were also abundant. Therefore, it was possible to assess the larval and adult stages of the frogs. Materials taken by scraping the gills and skin tissues of the fish and the skin tissues of the frogs were examined, and metazoan and protozoan parasites were observed under a viewpoint of X100. Parasites were photographed and identified to the genus level. In all of the study periods, parasites of the genera Dactylogyrus and Thricodina were detected in both fish and frogs. Specified ectoparasites are presented in charts. According to these results, ectoparasite transmission from frogs to fish was observed.

Keywords: Japanese Fish, Toads, Parasitic Transmissions

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THE INVESTIGATION OF MEDICAMENTS AND VACCINES IN TROUT FACILITIES LOCATED IN KEBAN DAM LAKE (ELAZIG, TURKEY)

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Abstract:

In this study, investigation of medicaments' and vaccines' that use for applied treatment method against common diseases at 39 fish farm where made in production facilities about rainbow trout (Oncorhynchus mykiss) at Keban dam lake, located on the border of Elazig one of important fisheries area made by taking necessary records retro perspective questioning made, the efficacy of the vaccine's and medicament's was studied to reveal.

By using the answer that given TUKEY and ANOVA test were made, link between the measures taken by disease factors was evaluated statistically. According to these results, in the ANOVA test between pathogens and pharmaceutical efficiency, significant differences were found ($p<0,01$). When compared to year production capacity, a significant difference was found between the years ($p<0,01$). According to results of variance analysis made between pathogens and preventions, it is understood that no significant difference ($p>0,05$). According to results of variance analysis made between engineer number, pathogens and preventions, it is understood that no significant difference ($p>0,05$). It is understood that no significant difference between production capacity and workers ($p>0,01$). In interviews with companies where vaccination, it is learned that vaccination is more preferred, and the vaccines that applied cause pre-protection and detected that this pre-protection reduce application of antibacterial medicines.

Keywords: Oncorhynchus Mykiss, Keban Dam Lake, Vaccine, Fish Production Facility

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IGS RINEX DOWNLOADER SOFTWARE

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Abstract:

This paper introduces the software which allow to download rinex files from SOPAC (Scripps Orbit and Permanent Array Center) achieve. It is written in QT programming language. Software allow to download the available rinex files with respect to the interval of the year and day of the year (DOY) for IGS stations. There is no limit for the number of rinex files to be downloaded. The software also check the all available data format like compressed zip files, hatanaka files or observation files. Generally SOPAC directories include only compressed zip files whereas some directories include only hatanaka files (.d) or observation files (o), in this kind of station, the software check all of the data types due to prevent any skipping files for downloading. Graphical User Interface (GUI) was created for convenience of the users. Users can choose any directory for downloading. Several warning messages was appended in the source files. Some of the messages include downloading status of the files whether it is succeeded or not and checking the files which were already downloaded in the working directory. The software work on LINUX operating system. Source codes can be downloaded from https://www.konya.edu.tr/personel/sermetogutcu (in projeler section). Users who want to use the software should compile the source codes in QT programming language on the LINUX operating system. Only requested field of the software is the password input. Password should contain any of the valid e-mail addresses.

Keywords: Igs, Gnss, Sopac

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A STUDY ON THE RESULTS OF 3-DIMENSIONAL PHOTOGRAMMETRIC CULTURAL HERITAGE DOCUMENTATION STUDIES OF SOME HITIT MONUMENTS IN THE SOUTHERN PART OF THE CENTRAL ANATOLIA

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Abstract:

In this work, in the light of historical data, the documentation studies of the Hittite monuments, which were photogrammetrically modeled in the Konya region before were examined. In this context, close-range photogrammetric technique was used to create a three-dimensional model and Global Positioning System (GPS) was used to georeferenced a 3D model of the monuments. Thus, measurements that represent real-value can be obtained with high accuracy on the model. Demonstrating that the production of the 3D digital model of the monument is a useful and cost-effective way to preserve the cultural heritage for future generations. In this context, a collective evaluation of Eflatun Pinar , Fasillar and Yalburt monuments was conducted. Metric values were obtained with high accuracy for use in documentation studies through the obtained photogrammetric 3D models. Eflatun Pinar monument was situated 25 km from Beysehir district. It is a monument from Hittite empire era. The plan of the monument is four corners with a front width of 7,02 m and an east wall width of 3,6 m.

Fassilar monument was situated 16 km from the Beysehir district and 40 km from the Eflatun Pinar monument. It is a monument from Hittite empire period. The monument are located on a hill on the west side of the village and are 7.40 m. in height. The monument was carved as a high relief on a block of monolithic limestone.

Yalburt monument was situated on a high plateau (1300 m) which is 16 km from the road of Konya-Aksehir. It is a pool monument built on hieroglyphic inscriptions of Hittite Empire period. The inside length is 12.70 cm, the width is 8.30 m., the wall thickness is 1.20 m. There are l9 hieroglyphic inscribed stone blocks around the pool. Most of the hieroglyphic inscribed stone blocks whose dimensions are varying as 1.30-3.25 length and 1 m wide are in good shape except a few of them.

Keywords: GNSS, 3D, Hittite Monument

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MODELLING AND FINAL QUALITY OF DRYING OPTIMIZATION ON BEE POLLEN

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Abstract:

Pollen is the most important product obtained after honey production in beekeeping. It is composed of 18 kinds of amino acids, 10 different minerals, vitamin C, D, E, natural hormones, enzymes, coenzymes, pigments, carbohydrates and ferments in addition to whole group B vitamins. This important product has to be dried and stored, and it is a necessity to be dried without sunshine so as not to lose valuable contents. In this study, bee pollen was dryed three different methods (oven drying, sensitive drying and vacuum oven drying) . Three different drying air temperatures (35, 40 and 45°C) will be used in dryers. Drying performance (drying duration, final moisture content), drying kinetics, color analysis were performed for all drying methods. Fresh samples were at an average moisture content of 19.1 percent and reached to desired moisture (% 4-5) contents in 5-16 hours. To define time-dependent changes in moisture contents, Midilli-Kucuk, Page, and Yagcioglu equations were used. Because of the Midilli-Kucuk equation has the highest R2 values (0,9999) yielded the best estimations. There were not significant differences in “b” yellowness values of fresh samples (22,33), 40□C of Oven and Sensitive dryer (22,24 – 22,46) statistically. Based on current findings, it was concluded that oven drying and sensitive drying were suitable for drying bee pollen.

Keywords: Bee Pollen, Drying Kinetics, Mathematical Modeling, Color Analysis

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DETERMINATION OF THE OPTIMUM DRYING CONDITION OF CULTURE MUSHROOM (AGARICUS BISPORUS (L.) SING.) IN TERMS OF DRYING PERFORMANCE AND RAW PROTEIN RATIO

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Abstract:

In Turkey are exported to be done in many regions of the mushroom cultivation has become one of the top five products. Mushroom production has averaged more than 50,000 thousand tonnes in our country in recent years. This figure The ratio of 45-50% is composed of Agaricus bisporus variety culture mushroom. This fungus variety constitutes on average 32% of the world fungal production due to both nutritional value and water content. The aim of the study was to dry the Agaricus bisporus variety of mushroom under different drying conditions and determine the optimum drying process in terms of final quality value. In the scope of the study, cabin type convective and microwave dryers were used in the convective dryer; 50, 60 and 70 ° C drying air temperatures and microwave respectively; 360, 540 and 720 W power ratings were applied. During the drying process, the product nipple was reduced to 10-15% of the wet base and was carried out in three replications. Drying products were compared with freshness, color and crude protein ratios according to freshness, and optimum drying conditions were determined in terms of final quality value. The average drying times of the products determined at the drying air temperatures of 50, 60 and 70 ° C in the cabin type dryer are respectively; 5.5, 4 and 3 hours, respectively, while the microwave power values are 360, 540 and 720 W respectively; 30.5, 16.5 and 15.5 minutes respectively. The most widely used Page, Midilli-Kucuk, and Jane-Das mathematical models were chosen in the literature to model the drying curves of cultured mushrooms. It is determined that the thin layered mathematical model which predicts the curves of the structure best is Midilli-Kucuk. When the dried products are compared in terms of chroma value, the closest value to the freshness is determined in the drying process at 540 W power value. When the ratio of crude protein is compared, the highest average is determined by drying at a drying air temperature of 50 ° C with a ratio of 32.44%.

Keywords: Mushroom, Drying, Raw Protein, Microvawe Oven

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BIODYNAMIC AGRICULTURE IN TURKEY; ISTAFIL BIODYNAMIC ORGANIC FARMLAND SAMPLE

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Abstract:

Biodynamic agriculture is the first agriculture system that is focused on ecological, soil health and healthy food. Biodynamic agriculture is considered to be an improved form of organic agriculture. It is an agricultural system that requires more comprehensive and more attention than organic farming. At the basis of biodynamic farming, farming is considered as a living organism and a holistic approach is concerned. It focuses on the creation of a cycle within itself and the sustainability of external inputs by reducing the most. Today, there are 5,279 farms and 180,000 hectares of biodynamic farming in many parts of the world. In Turkey, which was established in Istanbul Catalca Istafil Organic Farming Biodynamic farm is the pioneer of biodynamic agriculture in Turkey. Farm 41.1454 N, 28.2015E coordinates, 17 acres was built on land. Besides the organic farming certificate obtained from the farm control and certification company, it has the biodinamic organic farming certificate given by demeter.

There are cattle breeding, poultry, beekeeping unit, fruit gardens, grape areas, greenhouse areas, compost production areas, trellis, machinery park and management center in the farm. There are accommodation areas for eco-tourism, health tourism and educational activities. Istafil biodynamic organic farm, about biodynamic agriculture in Turkey continues to work as a pioneering and exemplary organization.

Keywords: Biodynamic Agriculture, Turkey, Istafil Biodynamic Farmland, Organic Agriculture

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THE EFFECTS OF ENCAPSULATED PROTEASE AND LIPASE INTO GELLAN ON THE PHYSICO-CHEMICAL PROPERTIES OF KASHAR CHEESE

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Abstract:

Kashar cheese is the most commonly produced and consumed cheese in Turkey, the Balkan Peninsula and the Mediterranean region after white cheese. The main problem in manufacturing Kashar cheese is the long maturation period, which increases the cost of handling significantly. Several attempts have been made to reduce the ripening period by the addition of individual and mixed lipase, protease and β-galactosidase enzymes, some of which have been reported to halve the normal maturation period of cheese. The addition of free lipase or protease has resulted in premature attack leading to excessive lipolysis, proteolysis and texture and flavour defects (Kocak et al. 1996). The use of encapsulated enzymes has been proposed to improve these drawbacks.

In tis study, lipase, protease and the mixture of them were encapsulated by using emulsion techniques in gellan and added to Kashar cheese milk to accelerate cheese ripening. The effect of encapsulated enzymes on the physicochemical properties of the cheese was investigated during 180 days storage.

According to the result, the best cheeses were obtained with encapsulated protease. So usage of encapsulated protease into gellan for Kashar cheese production could be recommend.

Keywords: Kashar Cheese, Encapsulation, Lipase, Protease, Ripening

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DETERMINATION OF VIABLE BACTERIAL COUNTS AND ACETALDEHYDE CONTENTS IN BIOYOGURT PRODUCED BY USING LACTOBACILLUS ACIDOPHILUS AND LACTOBACILLUS CASEI AT DIFFERENT INOCULUM RATES

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Abstract:

Due to their attributed health benefits, probiotic bacteria (such as L. acidophilus and/or Bifidobacteria) have been increasingly included in yogurts and fermented milks during the past three decades. The addition of probiotic bacteria is made not only because of certain claimed health-promoting effects in the intestinal tract but also because of the sensory aspects as well as the expanding variety of products that can be formulated with them.

In this study, the effects of different inoculum rates of Lactobacillus acidophilus and Lactobacillus casei of using in the production of bio-yogurt on the viable bacterial counts and acetaldehyde contents were determined during storage.For this purpose, different inoculum rates (1%, 2% and 3%) of both probiotic bacteria were tested. So, suitable inoculum rate were detected for production of bio-yogurt, which has enough probiotic bacterial content for supplying desirable aromatic effect and also the therapeutic minimum (106-107 cfu g-1). In addition to, the effects of inulin (at a rate of 1%) were searched for encouraging of probiotic bacterial development and quality of bio-yogurt.

According to the results, the effects of inoculum rate of probiotic bacteria, storage period and addition of inulin were significant on the physicochemical, microbilogolic and sensory properties of bio-yogurt ($p<0.01$).

Keywords: Bio-Yogurt, Probiotic, Prebiotic, Inoculum Rate, Storage Period

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EVALUATION OF THE CONSCIOUSNESS LEVELS OF PRODUCERS ON CLIMATE CHANGE, DROUGHT AND IRRIGATION HABITS: THE CASE OF TOKAT PROVINCE

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Abstract:

In the study, the level of awareness of producers on climate change, drought and irrigation habits subject were examined. The research was carried out in Tokat central province and districts. In the 263 producers identified, 34 questions were examined for that producers for these areas. A total of 300 surveys were conducted with preliminary survey studies. The producers described climate change as direct drought by 57.2%. Producers expressed that there was no drought that continuous and hampered crop production. The producers thought that effect of difference between pressure and surface irrigation methods on agricultural productivity was quite high. They also indicated that their level of knowledge about irrigation methods was sufficient.However, when the results obtained are examined, it is seen that they still use 61.3% irrigation by surface irrigation methods which are traditional methods. In addition, it has been determined that the producers who continue plant production in irrigated agriculture use 21.5% of groundwater and 78.5% of surface water as water source.

Keywords: Drought, Irrigation Method, Climate Change, Crop Production

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FORECASTING OF SHORT-TERM AGRICULTURAL MECHANIZATION, CLIMATE AND ENVIRONMENTAL CHANGES OF TURKEY

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Abstract:

Intensive farming is spread rapidly throughout the world with population growth and anthropogenic activities. Human activities lead to increased productivity in agriculture, and it also harms environmental elements. In this regard, Turkey's agricultural mechanization has been evaluated in terms of the environment and agriculture. The most basic method of determining the state of agricultural mechanization is known as the number of tractors. The number of tractors in Turkey increased while 21.24% last six years is estimated to increase by 3.26% over the next six years. The increase in number of tractors lead to increase agricultural areas, because of this deforestation and some harmful gas emissions are increased. This study aims to explain the forecast of total carbon dioxide (CO2), agricultural methane (CH4) and agricultural nitric oxide (NO). Within this scope, short term forecasts prepared during the data from 1990 to 2016 from the World Bank data bank with using the ARIMA model. All in all in Turkey, total CO2 emissions will increase, CH4 emissions will decrease, and NO emissions is projected to remain stable.

Keywords: Emissions, Mechanization, Forecast

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EFFECTS OF GAMMA IRRADIATION AND UV-C LIGHT ON DECONTAMINATION OF BEE POLLENS

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Abstract:

Nowadays, the preference of products rich in bioactive compounds is gradually increasing. Pollen is a bioactive food with high nutritional value, which is gathered from flowers by honey bees. In spite of its high nutritional value and bioactive properties, there is no standardization about bee products to put on market as qualified products in some countries. Due to high water content and nutritional value, pollen can be exposed to spoilage by microorganisms. Generally, bee pollen consumed as dried, but drying is not enough to eliminate microorganisms. In this study, four different monofloral bee pollens, poppy pollen, opium poppy pollen, mustard pollen and rabbit weed pollen, gathered from Turkey were dried at 42°C by using vacuum dryer and then pollen samples were irradiated and applied UV-C light in order to decrease microbial load of pollen samples. The doses were applied as 2.5, 5, 7.5,10 kGy and 2.97, 3.02, 5.95, 6.04 J/cm2 for gamma irradiation and UV-C light, respectively. To evaluate efficiency of applications, total mesophilic bacteria, yeast and mold, total coliforms, psychotropic bacteria were analysed in fresh pollens, dried pollens, irradiated and UV-C light applied pollens. Drying process was not effective to decrease microbial load of samples. After gamma irradiation, overall microbial load of samples was decreased. In general, gamma irradiation at 7.5 kGy was enough to reduce microbial load to undetectable values in the pollens. UV-C light was not found effective as gamma irradiation as.

Keywords: Gamma Irradiation, UV-C Light, Bee Pollen, Decontamination

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BIOACTIVE CHARACTERISTICS OF PEEL AND FRUIT OF MEDLAR (MESPILUS GERMANICA L.) EXTRACTED WITH DIFFERENT SOLVENTS

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Abstract:

Medlar (Mespilus germanica L.) is a climacteric fruit from Rosaceae family. The ripening period of medlar is long. It is consumed as marmalade by the local people. Medlar is an important fruit because of containing sugars, fatty acids, minerals, phenolics and anthocyanins. In this study, total phenolic content (TPC), total flavonoid content (TFC) and antioxidant capacity (AC) of fruit and peel of medlar were carried out. Antioxidant capacity was carried out two different methods which were DPPH and CUPRAC methods. Total phenolic content and total flavonoid content were determined as spectrophotometrically. Fruit and peel parts of medlar were extracted with methanol (80% v/v) and acetone (70%). Acetone extracts of fruit and peel were found higher level than methanol extracts in TPC, TFC and AC. TPC and TFC values were found between 223.27±10.62 mg GAE/kg to 2541.59±44.94 mg GAE/kg and between 86.37±9.26 mg CAE/kg to 1417.42±58.96 mg CAE/kg, respectively. Also, the result of DPPH and CUPRAC analyses were found between 1455.58±107.15 mg TEAC/kg to 4731.90±97.49 mg TEAC/kg and between 1782.87±120.47 mg TEAC/kg to 5481.61±138.56 mg TEAC/kg. The highest values of all analyses were found for acetone peel extract and the lowest were found for methanolic fruit extract.

Keywords: Mespilus Germanica, Medlar, Bioactivity

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DESIGN OF LOW POWER 6-BIT DACS USING 180NM CMOS TECHNOLOGY

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Abstract:

In this paper, high speed digital-to-analogue converter architectures, which are highly in demand in today's wireless communication systems, are briefly addressed. Two of the most popular DAC architectures, which are R-2R ladder network and charge scaling based are focused on and compared in this study. For this purpose, a 6-bit R-2R DAC and a 6-bit charge scaling DAC using split array are designed and simulated in TSMC 180nm CMOS process. Since the primary active element is OPAMP in designing DACs, a high performance OPAMP circuit is also designed and proposed in this work. The simulation results include DNL/INL of 0.028/-0.53 LSB, average power of 6.54mW at conversion rate of 2 GS/s for the proposed R-2R DAC implementation without opamp buffer, while DNL/INL of 0.013/-0.27 LSB, average power of 375µW at conversion rate of 10 MS/s for a conventional charge scaling DAC implementation with ±2.5V power supply voltage. Tanner Tools Pro platform is used for design and simulation. However, post layout simulations have not been completed yet but are planned as a near future work.

Keywords: R-2R Ladder Network, Charge Scaling DAC, DNL, INL, CMOS Data Converters, Mixed Signal Vlsi

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OXIDATIVE STRESS BIOMARKERS IN LIVER AND GILL TISSUES OF EUROPEAN CATFISH (SILURIS GLANIS LINNAEUS, 1758) CAUGHT FROM DIFFERENT REGIONS OF CEYHAN RIVER (ADANA, TURKEY)

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Abstract:

Objectives: The oxidative stress biomarkers in liver and gill tissues of Sheatfish were identified. The oxidative stress response in liver and gill tissues in polluted regions and also to identify that antioxidants are significant indicators against peroxidative damage. Moreover, the suitability and sensitivity of fish oxidative stress biomarkers in early detection for the fresh water ecosystem health was evaluated. Methods: The temperature and pH levels of the water were measured by digital pH meter. Nitrite, colorimetric method; nitrate, cadmium reduction; ammonia, phenate method; dissolved reactive phosphorus, ascorbic acid and chemical oxygen demand were determined by titrimetric methods. The results obtained were assessed in terms of pollution according to UNESCO / WHO / UNEP (2003). Catalase, glucose-6-phosphate dehydrogenase as well as glutathione levels were analyzed by the method of Beutler (1975). Superoxide dismutase activity was investigated according to Fridovich (1974) in the liver and gill tissues of the Sheatfish. Malondialdehid (MDA) level was determined via the method of Ohkawa et al. (1978).

Results: The physico-chemical parameters indicated that the water at Ceyhan river had higher all of the parameters than at Aslantas dam. All enzyme biomarkers except for SOD were monitored at higher levels in the contaminated area. GST and SOD amounts (in the gill tissue) showed a significant reduction in the polluted area.

Conclusions: According to the results obtained from the oxidative stress parameters considered as health indicators, the levels of adaptive response that the fish has given through resistance mechanism against poor environmental conditions is quite obvious. The findings of the present investigation suggest that oxidative stress biomarkers, especially the estimation of antioxidant systems in fish, could provide a useful indicator of pollution of the water source.

Keywords: Ceyhan River, Oxidative Stress Biomarkers, Sheatfish (Siluris Glanis)

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BIOCHEMICAL INDICATORS (BIOMARKERS) IN GILL TISSUE OF EUROPEAN EEL (ANGUILLA ANGUILLA L., 1758) CAUGHT FROM DIFFERENT REGIONS OF CEYHAN RIVER (ADANA, TURKEY)

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Abstract:

Objectives: This study was carried out in a domestic, slaughter house and industrial discharging region of Ceyhan River (station I) under the crest of the Aslantas Dam (station II) on the same river. Levels of pollution indicator parameters of the water were observed and their effects on various oxidative stress biomarkers in gill tissue of eel were investigated.

Methods: The research was carried out during the summer months and 40 fish from each region were studied. The water parameters, nitrite, colorimetric method; nitrate, cadmium reduction; ammonia, phenate method; dissolved reactive phosphorus, ascorbic acid and chemical oxygen demand were determined by titrimetric methods. The results obtained were assessed in terms of pollution according to UNESCO / WHO / UNEP (2003). The oxidative stress biomarkers, included catalase, glucose-6-phosphate dehydrogenase as well as glutathione levels were analyzed by the method of Beutler (1975). Superoxide dismutase activity was investigated according to Fridovich (1974) in the gill tissue of the eel. Malondialdehid (MDA) level was determined via the method of Ohkawa et al. (1978).

Results: All water quality parameters in station II were found higher than those in the station I. According to the biomarkers results, all of the parameters except for G6PD in the station II increased by 2-3 times. High levels of CAT, SOD, GST, and MDA activity were found in the gill tissue of fish collected from the river Ceyhan discharging region.

Conclusions: During the study, morphological disorder, disease or death were not observed in the fishes caught from Ceyhan River and Aslantas Dam Lake. The induction of antioxidant systems in gill tissue as well as their inhibition should be considered a clear indication of the presence of pollution and environmental health degradation.

Keywords: Biochemical Indicators, Ceyhan River, European Eel (Anguilla Anguilla), Pollution

[*]This research was supported by the Academic Projects Unit of Cukurova University (Projet Number: FBA-2017-9591)

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DETERMINING FRONT ARM MUSCULAR STRENGTHS WITH EMG SIGNALS AND FOREARM ANTHROPOMTRIC MEASUREMENTS

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Abstract:

Human hand is the most important component affecting the function of the upper extrimity and performing function for the continuity of daily life activities. For this reasin grip strength is considered as an objective measure in assessing upper extrimity performance. Studies have shown that hand grip strength is releted with forearm muscle strenght as well as general body and pulmonary muscle strength. Ratio of forearm lenght - circumfrence, hand size, agge, body mass index (BMI), hight are the prodictive indicators of hand grip strength.

In this study, the gripping forces created by forearm muscles were tried to be analyzed using anthropometric dimensions mentioned above and EMG (Electromyography) signals. To measure the muscle forces, participants including male and female having similar physical characteristics, such as BMI, height, age etc. were used. It was realized that diffirent and additional evolution techniques should be used for male and female participants to measure the muscle forces. Therefore, it would be beneficial for female participants to use additional variables other than the ratio of forearm lenght to circumference in estimation of the muscle forces

Keywords: Biomechanic, Biosignals, Muscle Forges, Grip Strength

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ANALYSIS OF PRESEISMIC AND POSTSEISMIC DEFORMATION OF GULBAHCE AND SURROUNDINGS WITH SIGACIK (IZMIR-TURKEY) EARTHQUAKE (2005)

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Abstract:

One of the most important cities of Western Anatolia is Izmir. A great number of tectonic structures located in Izmir and surroundings, so there are high seismic activity. Within this study, preseicmic and postseicmic deformation analysis of the earthquake whose magnitude is Ml =5.9 occurred in Sigacik Gulf where is located in the south part of Izmir on 17/10/2005 have been carried out. Before the earthquake, preseismic deformation analysis has been carried out by evaluating the GPS velocity datas obtained from the Global Positioning System (GPS) campaign measurement held in the years 2001, 2003, and 2004 in SSPX software. It is stated that the deformation areas obtained as a result of analysis and the distribution of earthquake areas in the region are compatible to each other. In consequence of deformation calculated by evaluating the velocity datas obtained from the GPS campaign measurement conducted in the region in 2009, 2010, and 2011 after the earthquake, it is seen that high deformation areas have been moving towards to northwest. It is observed that the high deformation area has displaced to north of Gulbahce after the earthquake in Sigacik in 2005 and this deformation are is compatible with the current earthquake distributions.

Keywords: Deformation,Earthquake,Gulbahce, Preseismic, Postseicmic

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MAGNETIC ANOMALY OF THE MID-ATLANTIC RIDGE AND ITS SURROUNDINGS OBTAINED FROM SWARM CONSTELLATION

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Abstract:

The Swarm constellation was succesfully launched by ESA on 22 November 2013. Swarm constellation was comprised of three different spacecrafts, Alpha, which was used in this study, Bravo and Charlie. In this study, in order to examine current location of the Mid-Atlantic Ridge, the Swarm satellite magnetic data was used. Total magnetic field intensity and Residuals of the total magnetic field intensity was obtained from Swarm Vires services. Furthermore, the heat flow data ,which was obtained from American Association of Petroleum Geologists (AAPG), is used for comparing magnetic anomaly with heat flow. It is known that magnetic anomaly decreases at the points where Curie Temperature is exceeded. Current earthquake data was used for locating active zones at the ridge.The various data processing techniques, such as polynomial fitting, reduction to the pole, filtering was applied to the data, which was obtained from Swarm Alpha, with the aim of revealing main magnetic anomaly of the Mid-Atlantic Ridge and its surroundings. The high consistency has been observed between heat flow data, current earthquakes data and the processed magnetic data. This study demonstrates that the magnetic data, obtained from Swarm constellation mission, is available for using in crustal studies.

Keywords: Swarm Constellation, Magnetic Anomaly, Mid-Atlantic Ridge

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COMPARING DEPTH VALUES OF GEBCO BATHYMETRY AND WAVELET TOMOGRAPHY RESULTS IN THE CHALLENGER DEEP POINT OF MARIANNA TRENCH AND SURROUNDINGS

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Abstract:

The deepest point of the world, Marianna Trench, is formed as a result of the thrusting Pacific Plate to the Philippines Plate. Mariana Trench stretches for more than 2.540 km with a mean width of 69 km. The greatest depths are reached in Challenger Deep (~11 km), a smaller steep-walled valley on the floor of the main trench southwest of Guam. In this study, depth values which are obtained from the General Bathymetric Chart of the Oceans (GEBCO) and by applying wavelet tomography to the World Gravity Map (WGM2012) Complete Spherical Isostatic gravity anomaly were compared. The most important convenience of the Wavelet Tomography method is that it does not require any inversion technique. As a result, the deepest point of the GEBCO data was obtained as 10.8 km. The result of the wavelet tomography again reached a depth value of about 11 km. In addition, profiles were taken from different places for comparison and values were examined. In this study, it is seen that WGM2012 data will be informed about the basolateral fundus by applying wavelet tomography method. In this study, it is seen that WGM2012 data will present knowledge about base topography by applying Wavelet Tomography method

Keywords: Marianna Trench, Wavelet Tomography, Gebco, Wgm2012, Challenger Deep

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POST-SEISMIC SURFACE DEFORMATION OF 2017 MEXICO EARTHQUAKES

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Abstract:

On June 14 and 22, 2017, earthquakes with magnitudes 6.9 and 6.8 respectively hitted Mexico City and caused death of more than 50 people. Also on September 8, 19 and 23, 2017, earthquakes with magnitudes 8.2, 7.1 and 6.1 respectively occurred in the Mexico City and caused death of more than 300 people according to initial reports. In this process, about 800 aftershocks have occurred. In this study, it was aimed to determine the surface deformations caused by these earthquakes using Sentinel-1B SAR data. In this context, 32 SAR data those dates between 10 October 2016 and 17 October 2017 were used as slaves. The SAR data for the day of October 28, 2016, proposed by the Optimal InSAR Master Selection module, was selected as the master. As a result of the evaluations, a DEM error between -0.02 and 0.02 rad/m was observed. In addition, reference Line of Sight (LOS) deformation values of 20 to -30 mm/year were obtained. In the unwrapped phase results, phase values in the interferograms were observed to decrease to 7.7 rad values after the earthquake.

Keywords: SAR, Insar, Sentinel, Mexico, Master, Earthquake

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SECURITY DOOR LOCK WITH MULTI-SENSORY BUTTON

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Abstract:

When people open their doors, they usually use the keys they carry in their pockets. As an alternative to these used keys, it is possible to open the doors which are authorized with RFID-enabled key holders or ID cards. But it seems that different alternatives have not been developed much. Moreover, none of them carries the sensory understanding dimension of the person and it is not possible to determine whether or not the entrance request has been made by that person. In this study, it is possible to open the door with the identification of the person by taking into account the pressing rhythm and pressing force of the person with a button placed in the door. Thus, it is possible to open the door according to the person's identity and authority without carrying any object beside it, and it will have a unique original value. The microsecond data between each print for the print ritm of the person is recorded in the generated database. Comparisons are made taking into account a range according to the age of the recipient to be obtained in the subsequent editions, and the person is used for confirmation. In addition, the pressure data of the person is kept in the database for each edition and a comparison is made considering a range according to age. In the study, the data of 10 different persons will be recorded in the system and the information of people using the subjective button will be recorded. Then, in addition to these 10 different people, a total of 20 people, including 10 different people, will be able to use the system 5 times. In total, 100 pieces of door opening request data were recorded and the success percentage was revealed.

Keywords: Rhythmic, Pressure, Button, Password, Door Lock

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PREDICTING AUTHORS USING ARTIFICIAL NEURAL NETWORKS IN TURKISH CORNER POSTS

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Abstract:

The natural language processing area deals with document classification and verification procedures. If a text is to be identified, the most important feature is undoubtedly the features to be used, and these properties will directly affect success. In this study, 10 authors from four different Turkish newspapers were randomly selected and a total of 10 corner posts of each author were randomly determined. Thirty features identified for author identification are specified for author recognition and input to back propagation artificial neural networks. In this study, in which the author name model is constructed as output, training and test data are separated by k-fold cross-validation method in six different ways. Inner layer nerve numbers were also changed by different layers and values and experiments were aimed to reach the best models. As a result of the study, different accuracy ratios were obtained for each newspaper. The highest success rate was 86.9% while the lowest success rate was 75.0%. The differentiation of success rates is thought to be influential in the authorship characteristics of each newspaper author.

Keywords: Author Estimation, Artificial Neural Networks, Corner Post, Text Classification

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FINANCIAL RISK ANALYSIS EXPERT SYSTEM FOR AUTOMOTIVE INDUSTRY IN TURKEY

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Abstract:

Nowadays, credit contributors, investors and shareholders who are called decision makers want to know the detailed financial condition of companies. The most essential tables that show the financial condition of a company are balance-sheet and income statement. In the past, many studies used these tables to get financial ratios that were used to evaluate the financial condition of companies. In this study these financial ratios were used to calculate financial success levels and the impact of micro and macro indicators on financial success levels. For this purpose the data in years between 1998 and 2013 years of 6 companies which work in Turkish Automotive Industry were used. Relationship analysis was performed using fourteen variables to create 2D (two dimensional) relation maps with Kohonen self organizing maps method. As a result of this study, SOM was seen as a useful tool for analyzing of financial conditions of a company, determining the financial risk signals and investigating the ideal automotive investment company attributes. The results might be beneficial for credit contributors, investors and shareholders.

Keywords: Financial Ratio Analysis, Automotive Industry, Self Organizing Maps (Som), Kohonen, Expert System

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CRITICAL SUCCESS FACTORS OF HIGHER EDUCATION AND THE PLACE OF INNOVATION IN FUTURE UNIVERSITIES

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Abstract:

The roles of universities at producing knowledge and constructing national and regional innovation systems are very important. Due to the information age, increasing commitment for more innovative products, growing demands for interdisciplinary knowledge and changing industry needs for new human skills are reshaping the new generation of universities. In this context, some of the factors are getting more importance such as strategy development, innovation management, new learning methods, new teaching environment and new innovation models.

In this research, the factors affecting the structure of future universities were examined and a conceptual model for evaluation was proposed. Strategic management methods such as SWOT analysis, Critical Success Factors and McKinsey 7S model were used to define the most important factors and sub factors building for future universities. We started off with a list of four core questions around the topic which arose from literature review: • What are the problems of industry, government, universities and graduates related to adopt the changes in information age? •What are the expectations from future universities? •What are the most likely enablers and barriers of future universities? •What are the critical success factors of higher education system for information age? Second a survey was prepared to set the priorities of critical success factors in higher education systems. The survey was sent to 1000 stakeholders (industry, university management, faculty, students and graduates) of this system. According to the 53 respondents' answers, these factors were found most important: "new teaching environment", "new offices for technology and innovation management", and "IT infrasturcture". According to the survey results, some of the sub factors will be discarded from the conceptual model. The final model may serve to the higher education organizations to achieve the mission of being a new generation university.

Keywords: New Generation University, Innovation, Critical Success Factors

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ANALYSIS OF STREAM FLOW COMPONENTS TO DETERMINE EFFECT OF INDUSTRIAL ZONES ON ERGENE RIVER BASIN

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Abstract:

Direct runoff and baseflow are the result of natural hydrologic process, however the return flow (treated or untreated used water discharged into streams) is the response of human intervene on river basin. In this study, daily measured streamflow of Ergene River Basin is analyzed by various hydrological methods for detection its three components, which are direct runoff, baseflow and return flow. Ergene River Basin located at European part of Turkey with about 11 020 square kilometers of catchment area. Although the dominant land use type in the basin is agriculture, there are some areal-wise small intense industrial zones located nearby Istanbul metropolitan area, which have big impacts on water quality of Ergene River. In the Industrial zones, groundwater exploited from deep wells for dense industrial consumption and then its wastewater discharged into the river. This return flow evidently affects flow regime of the river and its water quality. Daily flow of the river is analyzed in stream gages by using low flow analysis method for detection of industrial, municipal and agriculture wastewater discharge in river flow. In addition, different empirical methods are used for baseflow separation in the analysis. Furthermore, the streamflow analysis result was examined by using a hydrological and water quality model, which was developed by using Soil and Water Assessment Tools (SWAT). The model successfully simulates historic streamflow and its components by considering continuous rainfall-runoff and flow routing along the river. After calibration of the model, it was re-run for hindcasting of long-term streamflow and then the results of different tools were compared. The results show that the return flow of the industry is dominant discharge of Ergene River in recent years. It was also demonstrated that the effects of industrial return flow on base flow first appeared in 1995 in the base flow separation analysis that was coincided with the time of industrialization of the region. The effect of industrial return flow is seen very clearly especially in summer seasons. The river was used to show ephemeral characteristic before 1995 in the industrial zone, but after that the river flow has been continuous even in dry summer seasons. This is the clear evidence of industrial return flow effect on flow regime of the Ergene River.

Keywords: River Flow, Baseflow Separation, Industrial Return Flow, Ergene River, Swat

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TOWARD SUSTAINABLE WATER MANAGEMENT OF ERGENE RIVER BASIN IN TURKEY

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Abstract:

A methodology for sustainable use of water was developed in river basin scale by using a novel metaheuristic technique that is known as Multi-Objective Water Cycle Algorithm (MOWCA). This technique is similar to Genetic Algorithm that uses natural hydrologic cycle components i.e, rainfall, evaporation, flow routing, as elements of evolutionary optimization tools. First, a framework that was developed as part of the Ergene River Basin Information System was used for generation of some scenarios for reduction of surface and subsurface water losses and pollution, re-use of polluted water and control of depletion of groundwater levels. Then, MOWCA optimization technique was used to determine optimum consumption of water for various purposes. This methodology has been applied for Ergene River Basin that has an area of 11 020 km2 in northwestern and Europe part of Turkey nearby to Istanbul metropolitan area. In this basin, groundwater has been exploited densely by seven organized industrial zone centers since 1995. Their waste water is discharged into Ergene River stream network together with some other point and non-point sources of pollutions discharged at different locations of the river network. Sources of pollutions include mainly treated and untreated wastewater discharges emitted from sporadic unorganized industrial zones, upstream urbanized areas, and agricultural activities along the river course. Groundwater level in some area has been depleted more than 40 meters in recent years due to immense use of groundwater for industrial use that puts water resources in the basin at high risk of scarcity and contamination. Toward sustainable water use and management of limited water resources in this region, various scenarios for water management schemes (consumption loss reduction, exchange surface water use instead of groundwater in industry and change of irrigation methods for agriculture) were proposed. Under economic, ecologic and sociologic considerations, the optimum water allocation for municipal, industrial, and irrigation from surface and groundwater resources was presented by this MOWCA optimization model as a road map of sustainable water resources management for Ergene River Basin. The results show that under limited water resources in the river basin and toward sustainable development of the region, water allocation for different sectors should be done by considering conjunctive water use of groundwater and surface water by means of water management models to reduce water loss and pollution.

Keywords: Sustainable Water Management, Water Use, Optimization, Ergene River

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INVESTIGATION OF OPTIMUM LONGITUDINAL TRANSPORT LIMIT IN VEHICLES FIGHTING AGAINST SNOW

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Abstract:

There is no specific and particular planning in the fight against snow in our country. Therefore, it is costly in areas where snow is heavy. In this study, the limit of the economic transport of the Bitlis-Rahva-Tatvan highway snow fight has been examined. According to economic limit transportation method; dozer is used between 0 and 100 meters, scraper is used between 100 to 1000 meters and trucks are used if the distance is more than 1000 meters. In this study, dozer, grader and trucks are used for the distances 0-100, 100-1000 and more than 1000, respectively. The mass distribution diagram of the vehicles used in the fight against snow is shown according to the specified distances. In the fight against the snow, the limit of transport in the longitudinal direction has been examined and it has also been seen that the efforts to fight snow with minimum cost have been made.

Keywords: Transport Cost; Snow Load; Highway

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DETERMINATION OF THE OPTIMUM NUMBER OF THE HEAVY EQUIPMENT USED REGIONS WITH HEAVY SNOWFALL

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Abstract:

In this study, the type and the number of the heavy equipment to be used were determined in areas with heavy snowfall according to the average annual snowfall data from the meteorology. In the fight against snow, heavy equipment such as dozer, grader and trucks are generally used. It was aimed to determine the number of vehicles used in advance and to prevent the problems to be experienced in the future by making a plan against the snow according to the number of vehicles detected. By specifying the number and type of vehicles to be used during periods of heavy snowfall, the minimum number of vehicles and the types and the maximum efficiency in the fight against snow are targeted. At the same time, it was aimed to determine the optimum number of heavy equipment used in the regions where the snow fighting was done and to maximize productivity by reducing the cost of snow fighting to the minimum number of cars and type, and the contributions to the country's economy were examined. In this study, it has been found that the number of construction machines (heavy equipment) to be used in areas with heavy snowfall has decreased in comparison with the previous years, based on 85% worksite productivity within the 9 hours of daily working time in the planning frame thus, it is seen that it provides economical advantage in fighting to snow.

Keywords: Fight Against Snow, Heavy Equipment, Snowfall

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EVALUATION OF FOOD PROCESSING IN TERMS OF BIOACTIVE COMPONENTS

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Abstract:

Humans tend to have interest and information in topics such as the relation of food and health, nutrition models, food processing methods and nutritional integrity of food. The processing of food may show positive or negative changes in terms of nutritional components. Pathogens and other undesirable microorganisms are inactivated by food processing. Pesticides, harmful contaminants are removed. The digestibility of some foodstuffs is increasing. Sensory qualities of food are being improved, shelf life is being extended. Some food components may become more convenient to use. Bioactive compounds are chemical compounds that exist as a small amount in the structure of foods and have a positive effect on health. Important bioactive components; carotenes, flavonoids, lycopene, phenolics, monoterpenes, phytosterols, capsaicin, kurkumin, L-carnitine, oraganosulfur compounds etc... Herbal sources are rich in bioactive components. It is known that bioactive components have positive effects on inflammation, cancer, cardiovascular diseases, obesity, diabetes, neurological disorders, bone resorption and immune system. Cooking tomatoes or making heat-treating sauce and tomato paste ensure that lycopene, an important bioactive compound, is released. Flavonoids in cocoa and chocolate are preserved by proper processing. When carrots are heat-treated, the bioactive component, beta-carotene, becomes digestible. The amount of bioactive components in the olive oil varies depending on extraction processing techniques, storage and heat treatment applications. In this review, the positive or negative effects of the food processing on the bioactive components are evaluated. Foods need to be processed for various purposes, but it is essential to apply the correct methods of processing and to inform the society accurately.

Keywords: Bioactive Components, Food Processing

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SOAPWORT EXTRACT AS A NATURAL FOOD ADDITIVE

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Abstract:

Soapwort (Gypsophila) is a herbaceous plant with many species that has economic importance. The part of the plant used is the roots. The extract of soapwort is used as a food additive in the preparation of Tahini halva, nougat, Turkish delight and sponge cakes. The active ingredient of soapwort is saponin. Saponins are glycosides of soapwort, which have surfactant properties.

Saponin is a significant component for Tahini halva. Tahini halva is known specific confectionary of Turkish public in the world. It is prepared from a mixture of sesame-seed paste (tahini), sugars, citric acid and soapwort root. Soapwort extract is obtained by boiling the roots of the soapwort. Saponin that is active substance of soapwort extract effects positively the colour and consistency of the halva and prevents especially the oozing of the oil from the halva in time by acting an emulsifier. Oil separation in halva during storage leads to a tough texture. The separated oil contaminates the packaging and reduces marketability. Also the halva producer use different concentration of soapwort exctract for Tahini halva. Thus total saponin level may be determined differently. Therefore, there is a limitation for using root extract due to haemolytic activity of saponins. Turkish Standart (TS 2590) is standart of Tahini halva in Turkey and total saponin level must be max 0,1% in Tahini halva. In the production of white-foamy Turkish delight (Sultan's delight), the use of soapwort root extract gives softness and a desirable texture to the product. The soapwort extraction can be added to the formulation of sponge cakes for the purpose of improved chewiness of cakes. The saponin of soapwort extract improve rheological, physical and sensory properties of sponge cake owing to the foam-forming ability of saponin.

Keywords: Soapwort, Saponin, Tahini Halva

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EXPERIMENTAL INVESTIGATION OF THE EFFECT OF FEED RATE ON GEOMETRICAL TOLERANCES IN TURNING OF 7075 ALUMINUM ALLOY

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Abstract:

Machine parts often combine with other parts to form systems. Production is very important between the dimensional and geometric tolerance values stated on the manufacturing drawing so that these parts constituting the systems can be installed without errors and fast. Particularly in moving systems in industries with narrow tolerance values such as aviation, defense, automotive, etc., parts must be produced between geometric tolerance values to minimize problems such as vibration, balance, high heat due to friction. The choice of manufacturing method and conditions are very important for the capture of these tolerance values. Generally, the machining method is preferred for machining parts and the turning operation is about one third of machining. Thus, while machine parts are shaped by turning, knowing the appropriate cutting conditions and cutting parameters know in advance about the end product quality, dimensional accuracy and geometric tolerance values. By knowing the ideal cutting conditions and cutting parameters, time and economic losses are prevented, the manufacturer and operator have many advantages. For this reason, the AA 7075 T651 Aluminum alloy, which is frequently used in many industries in this work, has a cutting speed of 100 m/min, a feed rate of three different feedrates (0.05, 0.1, 0.25 mm / s) and combinations of 0.5, 1.5 and 3 mm cutting depth parameters the effect of geometric tolerances (cylindricality, circularity, linearity) of the amount of advance was investigated. As a result, feed rate increase has led to increased geometric tolerances.

Keywords: Turning, Cutting Speed, Cylindricality, Circularity, Linearity

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WILD EDIBLE PLANTS OF THE KONYA (TURKEY)

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Abstract:

On earth, plants are basic elements of life in terms of almost all organisms. The population of our world is steadily increasing, so new food resources are needed. On the other hand, human beings who have a longer life span and prefer to feed on vegetal weight, which has been tested and proven positive effects many times. The identification of plants due to the limited occurrence of plants which can be consumed as food is very important in terms of offering different food alternatives to humanity. Present study emphasized that the detection of wild plants consumed often by the local people of the city of Konya as traditional or alternative food. Ethnobotanical richness belong to Konya transferred from generation to generation is very important. In the city of Konya (Turkey), wild edible plants consumed as traditionally. Present study, attributes a review article, the ethnobotanical studies had been done by Sezik E et al., (2000); Oral C, (2007); Tugay O et al., (2011); Keskin L, (2011) and Tugay et al., (2012) on wild edible plants in Konya and its surroundings are considered. According to the results of this ethnobotanical study, 116 taxa were identified as wild plants in the study area belonging to 37 different families. The most encountered wild edible plant families consumed as food were Asteraceae (22 taxa), Rosaceae (18 taxa), Leguminosae (10 taxa), Lamiaceae (7 taxa) and Brassiaceae (6 taxa). The aerial portions of herba, leaves and fruits were determined as the most favored parts about the plants. Tragopogon was found the most represent with 5 species. Wild edible plants are consumed in a variety of ways. Ethnobotanically, Konya is rich in flora due to its geographical situation. As a result, wild edible plants still consumed as traditionally in the city of Konya (Turkey) .

Keywords: Konya, Plant, Ethnobotany

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UNKNOWN HAZARD IN WORKPLACE: POISONOUS PLANTS

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Abstract:

Approximately 400,000 species plant grow naturally or as ornamental plants in the world and some of them are poisonous. We can define poisonous plants as plants containing toxic substances that can cause diseases and deaths when they are eaten by humans or animals. Certainly, influencing people sensitive to certain plants known as allergic events should not be taken in this definition. The aim of the study is to determine the ornamental plants grown in workplaces at Seydisehir (Konya) and to evaluate the level of knowledge of workplace employees about the ornamental plants. Present study was carried out between 2015-2017 years with employees in 253 enterprises in different sectors at Seydisehir (Konya). Employees were asked about plant names, general ecological requirements, whether they were toxic or not. The plants were photographed in the digital environment and samples were taken for their identification. As a result of the study, it was determined that ornamental plants were grown in 17 of the 253 enterprises. These plants are found in 18 taxa belonging to 9 different families. Eight of these 18 species identified as toxic. It has been determined that the workplace employees generally do not know the ecological requirements of the plants and do not have information about the plants which are poisonous.

Keywords: Ornamental Plant, Seydisehir, Workplace

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IMPROVEMENT ON MECHANICAL PERFORMANCE OF CHOPPED BASALT FIBER REINFORCED PBT COMPOSITE

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Abstract:

Mechanical properties of fiber reinforced polymer composites highly depend on the adhesion between fiber and matrix. If it is poor owing to polarity difference between fiber and matrix, the load transfer from matrix to fiber is low. The aim of this study is to improve the mechanical properties of chopped basalt fiber reinforced poly(butylene terephthalate) (PBT) composites using different silane coupling agents in order to reduce the polarity difference and make the fiber and matrix compatible. The composites are characterized by tensile, flexural, the impact tests, and morphological and dynamic mechanical analyzes. Test results show that used silane coupling agents improve the tensile strength and elastic modulus of basalt fiber reinforced PBT composite via improving the interfacial adhesion between basalt fiber and PBT matrix. On the other hand, the slight improvement in flexural strenght is observed while the impact properties does not change. As a conclusion, silane modification improves the mechanical properties (tensile and flexural strenght and elastic modulus) of basalt fiber reinforced PBT composite via different mechanisms including covalent bond formation, secondary bond (hydrogen bonding) formation and nucleophilic substitution reaction between fiber and matrix.

Keywords: Basalt Fiber, Poly(Butylene Terephthalate), Polymer Composite, Silane Coupling Agent, Mechanical Properties

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USAGE OF ARTIFICIAL NEURAL NETWORK AS A TOOL OF TECHNOLOGY DIFFISUON MODELLING

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Abstract:

In today's world, fast technological changes that are emerging are sometimes accepted by users, and sometimes users are able to resist these technological changes. In an age when the technological alternatives are so great, whether or not innovations will be accepted or in which rate will be accepted in the social structure have become important research topics for technology developers. For this purpose, there are many mathematical models developed in the literature such as Gompertz, Logistic and Bass diffusion models which are used to model the technology diffusion process. The common point of all of these models is that, they are compatible with the classic S-shaped structure of Technology Diffusion process. Also, the Technology diffusion process is a nonlinear process that requires the complexity of multiplicity of the input parameters.

In this study, it was first time, we used of Artificial Neural Network for technology diffusion modeling as a contribution to the literature. The technology diffusion modeling performance of Artificial Neural Network has been compared with Logistic and Gompertz Diffusion models in terms of MSE and R. As a conclusion, it is seen that if the technology in or after the stage of the "Late Majority" group, the usage of Artificial Neural Network for the technology diffusion modeling shows as better results as classical diffusion models.

Keywords: Artificial Neural Network, Technology Diffusion, Gompertz, Logistic

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A NEUROMARKETING APPLICATION IN TURKEY

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Abstract:

In the globalizing world, advances in technology and rapidly increasing competition have led to differences in consumer behavior and purchasing decisions. Firms should analyze the factors affecting consumer' behaviors in order to find a market to their products and survive.

Ever since the concept of "marketing" has become a scientific field, it has used and continues to use many scientific techniques to understand its customers' behavior. In recent years, "Neuromarketing" technique is one of the most effective methods for understanding consumer behaviors. Neuro-marketing is an emerging interdisciplinary field that combines marketing, psychology, neurology and economics. The aim of neuromarketing is to examine how the brain is physiologically influenced by advertising and marketing strategies. In order to assess the effectiveness of marketing strategies developed by the firms, the brain activity resulting from the display of the relevant strategy is monitored and measured using brain imaging techniques such as fMRI and EEG. The measurements are interpreted by experts and the implications of which strategies affect the human brain and how people's preferences are shaped are related to the neurological activity in the human brain. Neuromarketing is quite new and a field that needs to be studied.

In this research, neuromarketing study was conducted on a selected product family at a company belongs to retail sector in Turkey which has an extensive distribution network. Eye Tracking and FACS methods of neuromarketing strategies were used for determining the most preferred product from the selected product family. Study was conducted with sufficient participants. After the location of the most preferred product was determined, shelf management was applied as a sales management strategy. Findings show that; neuromarketing strategy can be used effectively in the retail sector to increase product sales.

Keywords: Neuromarketing, Eye Tracking, Facs

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VARTO (MUS) EARTHQUAKE (19.08.1966 MS = 6.8) IMPROVEMENT OF HISTORICAL IMAGES BY DIGITAL IMAGE PROCESSING TECHNIQUE

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Abstract:

August 19, 1966 magnitude 6.8 occurred in the year in Varto (Mus) earthquake, one of the biggest earthquakes in the last 50 years in Eastern Anatolia in Turkey. Due to the geographical area where the meadow has come into being, it has been quite effective, has created significant effects, and has lost its life and property. Although it has been over 50 years since the earthquake occurred, the results and future reproducibility, the periodic reflections and connections between the present day have not been discussed much. In the scope of the study, first visual materials belonging to the depression were searched and images which were not clear due to the black and white photographs of the period were improved with histogram equalization technique. This destruction of the ruins of the earthquake has now become observable again. In particular, the deformations formed in the field provide more clear information about the extent of the earthquake. However, deformations not observed in original photographs become more prominent after image processing. Images from different devices producing images are of different pixel quality. When grayscale problems occur in black-and-white images, color tones are shifting in color images. In order to transfer such images, especially historical images to future years, the image should be subjected to image improvement process so that detailed information can be obtained from the images. In this study, a software for the histogram equalization method developed for image improvement was developed and applied on existing historical images.

Keywords: Varto Earthquake, Histogram Equalization, Image Recovery

[*]*This study is supported by Scientific Activities Support Program of Bitlis Eren University*

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NON-DESTRUCTIVE DAMAGE ANALYSIS FOR CULTURAL HERITAGE BUILDINGS

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Abstract:

Non-destructive testing (NDT) methods are being increasingly used in the evaluation of cultural heritage buildings. Especially combined geophysical methods can be accurately applied structural evaluations of those kind buildings. Ground-penetrating radar (GPR) and PUNDIT were used in a complementary way as non-destructive testing techniques in many studies. The basic aim of the applications is to define the internal structural configuration as well as the stone quality, analysis of some structural elements' inner geometries and physical properties. GPR allows the detection of small anomalies (changes of about centimetres), and the results are used to select the most appropriate seismic tomography initial model. Results reveal the internal structure of columns, walls, showing different structural elements. Even when the visual inspection points to external damages, the detailed NDT evaluation indicates that the inner structure is in good condition and the ashlars are of good quality. The application was made in two different historical buildings in Istanbul, Turkey and detected structural problems.

Keywords: GPR, PUNDIT, Geophysics, Non-Destructive Testing

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A STUDIES ON WATER ABSORPTION BEHAVIOR OF WOOD FLOUR REINFORCED EPOXY COMPOSIT WITH FILLED MG(OH)2, AL(OH)3, AND PUMICE POWDER

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Abstract:

In resent years, the use of plant fibres and their waste as reinforcement material in polymer composites for making low cost and eco-friendly industrial products has generated much interest. All polymer composites absorb moisture in humid atmosfere and when immersed in water. The influence of absorption of moisture leads to the degradation of reinforcement metarial between matrix interface region creating poor stress transfer effiencies resulting in a reduction of mechanical and dimensional properties. The aim of study was to investigated influence of the pumice powder, Magnesium hydroxide, and Aluminum hydroxide water absortion behavior of wood flour reinforced epoxy composites. The wood flour were mixed with 10wt% magnesium hydroxide,and aluminum hydroxide and pumice powder respectively. Composites were prepared through the hand lay-up method at room temperature. Water adsorptions tests were conducted by immersing specimens in a de ionised water bath at 23 0C for 1 day, 3 days and 7 days. Water absorption of composites were measuremented by using the following equation;

C = (M_2-M_1)/M_1 X 100

The filled composites displayed higher sorption than the unfilled composites, due to the stonger interfacial interactions between the treated composites and particle size has a significant effect on the strength of particulate-filled polymer composites.

Keywords: Absortion, Epoxy, Particle Size, Green Composites, Enviromental

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16S RRNA DETERMINATION OF MICROORGANISMS UTILIZED IN COMPOSTING OF SOLID CAKE WITH MANURE

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Abstract:

Composting experiments with solid cake, manure and soil was recently conducted in the presence of selected microorganisms isolated from another compost mixture containing alfa alfa, solid cake and soil. Their properties were determined by both morphological and 16S rRNA analyses. These microorganisms were selected based on their effect on enhancing the degradation of organic matter in compost mixture. Morphological analyses of selected strains revealed the presence of a flora consisted of the members belonging to Bacillus genus and Actionmycetes class. However, 16S rRNA analyses indicated the presence of Escherichia and Enterococcus genus which were different from initial observations showing the presence of Bacillus sp. in the flora. Morphological determination for the members of Actinomycetes was turned out to be compatible with 16S rRNA analyses which had shown 98.55% relationship to Streptomyces tunisiensis and 97.83% relationship to S. matensis. The members of Enterococcus genus had 98.81% relationship to Enterococcus lactis and 98.61% relationship to Enterococcus faecium. The distinctive property of this genus is their commensalism with no harm on human or animal intestinal system. Although not recognized as “GRAS” (Generally Recognized as Safe), these could still be used in composting. On the other hand members of Escherichia could be pathogenic with its best known member E. coli (99.51% resemblence). 16 S rRNA analyses also revealed identical resemblance to E. fergusonii and 98.66% resemblance to E. albertii.

The use of Escherichia and Enterococcus genus in composting was not studied based on our investigations. However, literature survey indicated degrading effect of Pediococcus acidilactici, which was a close relative of Enterecoocus. Members of E.coli could be considered as candidate for compost application due to their increased proliferation in the presence of biodegradable organic matter.

Keywords: 16S Rrna, Escherichia, Enterococcus, Streptomyces

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EFFECT OF MOISTURE CONTENT ON THE MICRO-MECHANICAL PROPERTIES OF OAK WOOD

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Abstract:

Structural-size with defects and small-size clear samples (standard-size) have been used to determine the mechanical properties of wood. In recent years, micros-sized samples have been used to evaluate the mechanical properties of earlywood and latewood sections, wood strands, and fibers. The use of micro-size test samples to determine the mechanical properties of wood is gaining in importance. The aim of this study was to determine the effect of moisture content on the mechanical properties of Oak wood using micro-size wood samples. Sample trees were harvested from the Duzce Forest Enterprises in the northwestern part of Turkey. Six trees having straight stems were selected as sample trees. The micro- size specimens for bending, tensile and compression tests were prepared and divided to 5 groups. Each group was conditioned in different equilibrium moisture condition to achieve 8%, 12%, 16%, 20% and above fiber saturation point (FSP) moisture content. After conditioning, the bending strength, modulus of elasticity in bending, tensile strength and compression strength values were determined. The results showed that the mechanical properties of oak wood significantly decreased with increasing moisture content.

Keywords: Moisture Content, Oak Wood, Mikro-Size Samples

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THE SURFACE ROUGHNESS AND WETTABILITY OF PARTICLEBOARD PRODUCED FROM OF HYDRO THERMALLY TREATED WHEAT STALKS

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Abstract:

The main objective of this study was to investigate the surface properties of particleboards produced from wheat stalk. Annually 61 million ton, agricultural wastes are produced in Turkey. The research on the utilization of the annual plants in the production of particleboard and fiberboard is getting increase. Surface quality of wood composites is a physical property influencing different processes including their finishing characteristics. Wettability of wood based panels is also an important issue and is affected by thermal modification. The particles of wheat stalk were subjected to hydro-thermal treatment at a temperature of 180 °C for 8 minutes in a steam explosion machine. Hydro-thermally treated and non-treated wheat stalk particles were added at 10%, 20%, 30%, and 40% to the wood particles. The contact angle measurements were obtained by using a KSV Cam-101 Scientific Instrument connected with a dijital camera and computer system. The roughness measurements, roughness (Ra) and maximum roughness (Rmax), were performed using a fine stylus tracing technique. Statistical analyses showed significant differences in the surface roughness and contact angle values of the particleboard panels following thermal modification.

Keywords: Particleboard, Annual Plant, Hydro-Thermal Treatment, Surface Roughness, Wettability

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PREDICTON THE KERNEL WEIGHT OF THE ALMOND NUT VIA FIND LAWS ENGINE

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Abstract:

With the storage of data in databases, it has become possible for all institutional processes to have access to a reliable database. The analysis of a large quantity of data stored in databases and their interpretations require data-mining. As used in lots of field data mining can be used in agriculture. Estimating soil water parameters, weather forecast and fruit selection before marketing are some applications of data mining in agriculture. The physical properties are the most important parameters to be taken into account in product selection. However, data mining method which can be used for determining physical properties of agricultural products does not yet exist in the scientific literature. This paper presents the application of the process of data mining for predicting of the kernel weight of Ferroduel type of almond. The aim of this research is to estimate the kernel weight (KW) of this almond type based on physical properties, and to suggest a formulation for calculating. According to the R2 values we can say that we have significant and applicable rules at the end of the study.

Keywords: Data Mining, Prediction, Kernel Weight

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REVERSE LOGISTICS NETWORK DESIGN FOR THE RECYCLING OF LIQUID SOLID WASTES

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Abstract:

Due to the population growth in the world, the problem of not using the natural resources efficiently and the recovery of the used products have become global problems. Numerous national and international regulations have been carried out for recycling to ensure efficient use of scarce resources. Reverse logistic concept plays an important role in the effective design of recycling systems. The concept of reverse logistics is generally; implementation and control of secondary material deposits, material flow and related information, so that the material can be regenerated or destroyed by an appropriate method.

This study contains a reverse logistics network design for providing recycling of solid waste in a province of Turkey. A mixed integer linear programming model has been set up to choose between alternate recycling and collection facilities where solid waste recycling can occur at different rates, with minimal cost flow. The model is solved with the LINGO optimization package program. Findings indicate that, the cost of the recycling system has been increase with the increase of the recovery rate in the network depending on the capacity problem of facilities.

Keywords: Recycling, Reverse Logistics, Solid Waste, Network Design

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THE ABRASION RESISTANCE OF MORTARS CONTAINING NATURAL ZEOLITE ANALCIME

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Abstract:

It is always an expectation that to minimize of damage caused by abrasion as a result of increase of abrasion resistance of construction materials. Therefore, the influence of analcime on the abrasion resistance of cement mortars was investigated in this study. Analcime is a natural pozzolan and is one of the valuable minerals of zeolite group. The cement mortars were produced by using blended cements containing analcime. The abrasion losses by friction at the end of 28 days of the mortar mixtures were determined by Bohme surface abrasion tests in accordance with TS 2824 EN 1338. The abrasion tests were carried out to cement mortar mixtures produced with different cement replacement ratio (0%, 10%, 30% and 50%). The results obtained from test series were compared with each other. The test results showed that, abrasion losses of mortars containing analcime were lower than portland cement mortars as 25% approximately. As the content of zeolite in the mixtures increased, abrasion resistance increased. It is believed that this positive effect of natural zeolite in the development of abrasion resistance is due to pozzolanic reactions.

Keywords: Keywords: Abrasion, Analcime, Mortar, Natural Zeolite.

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MODELING LATERAL TRANSSHIPMENT PROBLEM IN SUPPLY CHAIN WITH REINFORCEMENT LEARNING

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Abstract:

Inventory management in supply chains involves a series of decisions and strategies. Inventory sharing policies among retailers is one of them. Lateral transshipment is one of the effective way of meeting uncertain customer demands. According to a certain lateral transshipment policy adopted by supply chain, retailers with excess stock send their inventory to retailers with low stock. Researches in literature show that a high level of customer service can be achieved at a lower cost in this way. We consider a supply chain which consists of one supplier and two retailers, and the lateral transshipment between retailers is allowed. The proposed approach is modeled using different reinforcement learning algorithms such as Q and R learning. Both replenishment and lateral transshipment quantities are determined using reinforcement learning to minimize total system cost including replenishment, lateral transshipment, holding and backorder costs. The performances of the reinforcement learning algorithms and the policies from the literature are compared with each other using simulation experiments.

Keywords: Supply Chain, Lateral Transshipments, Reinforcement Learning

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DETERMINATION OF UAVS THRUST SYSTEM PARAMETERS BY ARTIFICIAL BEE COLONY ALGORITHM

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Abstract:

With the development of technology, Unmanned Aerial Vehicles (UAVs) have become a popular application in aviation engineering and are now used for many purposes in military and civil aviation. While usage areas for military purposes of UAVs are such as defense, mapping, and attack; usage areas for civil purposes of UAVs are such as disinfection of agricultural land, search and rescue in emergency, traffic control, cargo transportation, fire extinguishing. The importance of the UAV design has increased with the expansion of the field of applications. One of the most important aims in UAV designs is the design of the thrust system. Selection of the propeller is one of the main parameter of the thrust system design. In selecting the propeller, two basic parameters are considered, namely the diameter and the pitch of the propeller. In this study, the calculation of the maximum thrust force required during a straight flight was considered. For this purpose, an approach based on the Artificial Bee Colony (ABC) algorithm is proposed for the design of UAV with maximum thrust force. In this approach, the diameter and the pitch of the propeller and current flight speed used in the power system design of the UAV is determined as the input parameters. The maximum thrust force versus these mentioned input parameters also is determined the output parameter. In order to obtain the maximum thrust force, effective results were obtained in determining the optimum input parameters with the ABC algorithm. The results of the study showed that the proposed approach would make it easier for designers to design UAV thrust systems.

Keywords: Uavs, Thrust System Design, ABC Algorithm, Optimization.

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EFFECT OF BATTERY SELECTION ON ENDURANCE OF UAV

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Abstract:

The use of Unmanned Aerial Vehicles (UAV) has increased in recent years. With this increase, UAV designers realize different designs depending on suitability to the requirements. One of the most important of these designs is the design of the electrical system to increase the endurance of UAV. The electrical system design for UAV includes various characteristics such as the aerodynamic and structural characteristics of the propeller, the characteristics of the electrical system equipment, and the UAV's own characteristics. It is desirable that the design of each of these characteristics is optimal. Electrical system equipment consists of equipment such as electric motor, propeller, battery, speed control circuit, cables and connectors. An important part of the electric system is battery packs. The battery generally represents the heaviest component of the UAV. While the UAVs' endurance is directly proportional to the battery capacity, it is inversely proportional to the battery weight. For this reason, the battery becomes an important factor in the design of the electrical system, which accounts for 60% of the UAV weight. In this study, the optimization of the battery selection for optimum endurance is discussed. Important design curves for battery selection are presented and explained in the study. The results show that the proposed method may be an alternative method for optimal endurance of UAV.

Keywords: Uavs, Battery, Endurance.

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EXPERIMENTAL INVESTIGATION OF HEAT TRANSFER AND DEVELOPMENT OF SHELL SIDE HEAT TRANSFER CORRELATION IN A MINI-CHANNEL SHELL AND TUBE HEAT EXCHANGER

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Abstract:

Shell and tube heat exchangers (STHE) are widely used for condensation, evaporation, heating and cooling of working fluid in power plants and industrial applications. SHTEs are preferred because of their simple geometry, ease of production and maintenance, and adaptation to demanding conditions such as high pressure differentials. Industrial SHTEs have a tube diameter of about 8-60 mm and an average area density of 100 m^2/m^3. As the tube diameter decreases, the heat transfer area per unit volume increases. Another important advantage provided by decreasing channel size is reduction of internal flow volume and dimensions of the heat exchanger. This increases compactness of the STHE, which results in a reduction in the amount of fluid to be used, mass and volume of the heat exchanger. This study shell side heat transfer coefficient was investigated experimentally in a mini-channel SHTE designed and prototyped using Kern method. The shell of mini-channel heat exchanger has an inner diameter of 30 mm, while 13 copper tubes with an outer diameter of 3 mm and a length of 240 mm have been used. In order to prevent excessive pressure drop and to increase heat transfer coefficient as much as possible on the shell side, 4 baffles with 25% baffle cut were used. In experiments in which water was used on both sides, the shell side inlet temperature was kept constant at 40°C and Reynolds number was changed between 250 and 1,850. The tube inlet temperature was kept constant at 20°C and Reynolds number was kept constant at 5,900 where the highest convection heat transfer coefficient was obtained. The experimental convective heat transfer coefficients on the shell side were compared with the Kern design, Nitsche, McAdams and VDI Heat Atlas correlations. The Kern design correlation is an average of 17% higher than experimental results, and difference increases with Reynolds number. The experimental results are on average 20% higher than the Nitsche correlation, and difference is decreased by Reynolds number. The McAdams and VDI Heat Atlas correlations are on average 6% and 41% higher than experimental results, respectively, and difference for both correlations increases with Reynolds number. The Nusselt (Reynolds, Prandtl) correlation for shell side heat transfer coefficient has been developed to be used in the design of mini-channel SHTEs. The maximum difference between experimental results and Nusselt correlation is less than 9.5%.

Keywords: Mini-Channel, Shell And Tube Heat Exchanger, Heat Transfer, Kern Method

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QUALITY FUNCTION DEPLOYMENT APPROACH FOR EVALUATION PARAMETERS OF HIGHWAY PAVEMENT

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Abstract:

To reach a satisfactorily performance of a highway and user satisfaction, several factors must be considered for providing safety, comfort and economical parameters in highway construction. In this study, assessment of highway engineering parameters has been made via Quality Function Deployment (QFD) method. QFD is a quality method that converts the requests of customers to measurable performance changes and major quality assurance points to be used throughout the production phase. To execute the method, firstly customer requests that are a portion of the house of quality were determined. After technical requirements were valued, degrees of contact with each other, relationship status between them of requirements and degrees of importance of customer requests were determined. In the study flexible and rigid pavements were considered as a coating type of highway. As a result, the importance order of technical requirements was occurred according to the values obtained from the House of Quality. With regard to this importance order which coating type providing technical requirements mostly were compared to each other.

Keywords: Highway Engineering Parameters, Quality Function Deployment, QFD, Flexible Pavement, Rigid Pavement, Comparison

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DETERMINATION OF MIXING AND COMPACTION TEMPERATURES OF POLYMER MODIFIED BITUMENS CONTAINING NANOCLAYS

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Abstract:

In recent years, the use of nanomaterials in different fields has become widespread with the development of nanotechnology. This development has also manifested itself in the field of modification of bituminous binders. In this study, 50/70 penetration grade bitumen was modified with Styrene-Butadiene-Styrene (SBS) polymer 3% and 5% by weight of the bitumen belongs to elastomer class, then two different nanoclays were added into the modified bitumen samples at different ratios. The workability of the obtained modified bitumens was investigated. It is important to avoid unnecessary energy consumption for the workability of bitumen and this depends on the choice of suitable mixing and compaction temperatures. For this, the viscosity values were measured at 135°C and 165°C temperature values. The viscosity values corresponding to these two temperature values were combined with a line, the temperatures corresponding to the viscosity values of 170±20 mPa.s and 280±30 mPa.s were determined as the mixing and compaction temperature values of the modified bitumens. The suitability of the obtained temperature values was examined and compared with each other.

Keywords: Polymer Modified Bitumen, Nanoclay, Viscosity, Workability

[*]This study is supported by Manisa Celal Bayar University Scientific Research Projects Coordination Unit (MCBUBAP).

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NUTRACEUTICS FOR THE CONTROL OF FISH PATHOGENS IN RAINBOW TROUT CULTURE

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Abstract:

Fish culture has become an important industry and is the world's fastest growing sector of agricultural business. Since the European Union ratified a ban in 2006 for the use of all sub-therapeutic antibiotics (Regulation 1831/2003/EC), scientists have intensified efforts to identify and develop safe dietary supplements and additives that enhance the life activity, health and immune system of farm fish. Phytochemicals are a large group of plant-derived compounds. Plants have bioactive compounds include certain polysaccharides, peptides, phytochemicals, vitamins, and fatty acids that are naturally present in foods, can be added to foods producing fortified or functional foods or can be formulated into dietary supplements. These bioactive molecules can be obtained either by extraction from natural sources or by chemical and biotechnological synthesis.

The objective of this paper is evaluated of some medicinal plants Artemisia absinthium L., Artemisia campestris L., Origanum onites L., Origanum vulgare L., Satureja cuneifolia Ten. for the control of fish pathogens in rainbow trout culture. A. absinthium L. and A. campestris L. extracts displayed the antiparasitic activity against H. salmonis in 21 days, compared with the negative control ($p<0.05$). Cumulative mortalities were decreased in all treatment groups. Feeds supplemented with essential oil of O. onites L. and O. vulgare L. were reduced mortality against fish pathogens, Vibrio anguillarum and Lactococcus garvieae in experimental groups. S. cuneifolia Ten. was reduced antifungal infection against Saprolegnia parasitica in rainbow trout eggs.

Keywords: Fish Pathogen, Artemisia Absinthium L., Artemisia Campestris L., Origanum Onites L., Origanum Vulgare L., Satureja Cuneifolia

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THE EFFECT OF HERBATREAT FOR THE CONTROL OF COLD WATER DISEASE

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Abstract:

Among bacterial diseases affecting cultured salmonid fish, Bacterial Cold-Water Disease, caused by Flavobacterium psychrophilum, produces high mortality and morbidity and consequently, economical losses worldwide. Attempts to control this situation through the use of antimicrobials have been limited due to the rapid appearance of antibiotic-resistant bacteria. For this reason, it is important to find new products with antimicrobial activity without the aforementioned undesirable effects of antibiotics.

In this study a total of 600 healthy rainbow trout with average body weigh of 2.0-2.5 g were obtained from commercial fish farm. Fish fed with feed supplemented with the phytobiotic Herbatreat manufactured by Objektif Ltd. (Turkey) as 1.0 and 3.0 ml fish-1 for 30 days. Negative control fish fed with no supplemented feed. Positive control group was 20 mg kg-1 florfenicol. For experimental infection, a virulent strain of the species F. psychrophilum infected by intra-peritoneal injection of a bacterial suspension containing 108 CFU/mL.

In our study, the survival of fish fed with the phytobiotic Herbatreat was similar to positive control and significantly higher than those of the negative control group ($p<0.05$). Thus, these diet supplements could be used as an alternative to antibiotics in the control and/or prevention of infectious diseases.

Keywords: Bacterial Cold Water, Herbatreat, Flavobacterium Psychrophilum

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NON–ISOTHERMAL CRYSTALLISATION KINETICS OF PLA/PBAT/O-POSS TERNARY BLENDS

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Abstract:

PLA is the most commonly used biodegradable polymer among the others as a result of its relatively better physical properties, full-scale commercial production, and its relatively low price. Although it has many advantages such as high strength and stiffness, its low toughness and brittleness significantly restricts its applications; therefore, toughening is required. Poly(butylene adipate-co-terephatalate) (PBAT) is another biodegradable polymer that can be easily processed without any converse effects on the environment. It can be used to toughen PLA via melt blending. On the other hand, PLA shows an extremely slow crystallization during non-isothermal processing such as extrusion and injection molding. This low rate of crystallization limits PLA's applications, as well. Polyhedral oligomeric silsesquioxanes (POSS) organic/inorganic hybrid materials are new generation nano-fillers and could provide molecular reinforcement, increased thermal stability and better flame resistance. POSSs also have a high potential to increase the crystallization rate of PLA since they have flexible chemical and physical hybrid properties with a reasonably lower price. Octaisobutyl-POSSs (O-POSSs) used in this study contain eight isobutyl groups. In this study, the non-isothermal crystallization kinetics of O-POSS reinforced PLA/PBAT blend was investigated. PLA/PBAT/O-POSS blend was prepared in a laboratory twin-screw microcompounder. Avrami, Ozawa and combined Avrami-Ozawa kinetic models were applied to understand the non-isothermal crystallisation behaviour. Furthermore, the nucleation activity of O-POSS nanoparticles was investigated in terms of Dobreva and Gutzow models. It was found that the crystallization rate of PLA in PLA/PBAT blend increased with the addition of O-POSS. In addition, O-POSS can be used as a nucleating agent for PLA/PBAT blend.

Keywords: PLA, PBAT, Polymer Blend, POSS, Non-Isothermal Crystallization Kinetics.

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SHAPE MEMORY PROPERTIES AND CHARACTERIZATION OF CROSSLINKED POLYETHYLENE/OIB-POSS COMPOSITES

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Abstract:

The aim of this study is to determine the properties of cross-linked linear low density polyethylene (LLDPE)/OctaIsobutyl functionalized polyhedral oligomeric silsesquioxanes (Oib-POSS) nanoparticles. The peroxide used in crosslinking in this study is tert-butyl cumyl peroxide (BCUP). The peroxide content was 3 phr. LLDPE/Oib-POSS/Peroxide composites were processed in an Xplore Instruments micro-compounder at a screw speed of 50 rpm and 135□C barrel temperature. The crosslinking was carried out using a hot-press operated at 175°C. LLDPE/Oib-POSS/Peroxide composites were characterized by performing tensile tests, differential scanning calorimetry (DSC), rheometer, scanning electron microscopy (SEM) and Fourier transform infrared spectroscopy (FTIR). From the results of the rheometer analysis, it has been found that the addition of Oib-POSS reduced the complex viscosity value of LLDPE, while the addition of peroxide leads to an increase in the complex viscosity and storage modulus values. The data obtained from the tensile test showed that the cross-linked composites exhibited lower elongation at break values (%). Moreover, shape recovery ratios reduced by the addition of Oib-POSS.

Keywords: Linear Low Density Polyethylene, Peroxide Crosslinked Polyethylene, Composite, Shape Memory.

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THE EFFECT OF DISTANCE TO RESIDENCE ON RECREATION PREFERENCE; THE CASE OF BELGRAD FOREST

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Abstract:

Forests are the main areas that preferred for recreational activities especially in the major cities of Turkey. Istanbul is the most urbanized city in Turkey and the forest named as Belgrad is one of the oldest and famous forest areas that located on the north side of the city. According to the previous researches for the last 10 years period, the average number of visitors per year is 941032 visitors, which is an intense recreational demand for the forest. In literature, many studies show that close distances are preferred for recreational activities. In our study, we tried to understand the effect of distance between residence and the preferred of Belgrad Forest as a recreation area. For this purpose, we performed inventory between 123 visitors randomly in Belgrad forest. Frequency analysis was used to interpret the obtained data. Results show that majority of the visitors who prefer Belgrad Forest (74 %) are coming from 20 km away and more distances. Inventory results demonstrate that the main reason for this prefer (46 %) is the popularity of Belgrad Forest. It can be inferred that the distance to the residence is not the main criterion when recreation potential is determined, particularly for popular forest areas.

Keywords: Recreation, Distance To Residence

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COMPARATION OF THE CARBON FOOTPRINT AND SEQUESTRATION FOR A FOREST AND NEIGBOUR TWO DISTRICTS

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Abstract:

Increases in the concentration of carbon dioxide represent one of the most important environmental issues in our time. Human activities such as heating, transportation and electricity consumption contribute gradually to this increase. There are different measures to reduce the amount of carbon concentration in the atmosphere. One of these measures is terrestrial ecosystems such as a forest, which has gained importance because of its potential to sequester carbon. Hence carbon emissions are different from city to city, varies by purpose or consumption category. We quantified the annual carbon footprint from consumption of goods and services for two districts in Istanbul city. We analyzed the data of six categories: house, flights, car, motorbike, bus and rail and secondary (food, clothing, services, trade etc.) from an existing survey study. On the other hand, annual carbon sequestration was calculated for Belgrad forest that is near to two districts. Lastly, the carbon footprint of districts and Carbon sequestration of Belgrad forest were compared. According to the results of a survey conducted in 2014 were examined, approximately 6,475,500 tons of Carbon was released annually in districts while 13,170.97 tons of carbon was stocked by neighbor Belgrad forest.

Keywords: Carbon Footprint, Carbon Sequestration, Forest, Gis

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OPTIMIZATION OF COATING PARAMETERS FOR WATER VAPOR RESISTANCE OF DENIM FABRICS BY USING TAGUCHI METHOD

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Abstract:

Denim garments have been preferred by a wide range of consumers without limitation of age, gender and social status. Innovative approaches are needed in the production of denim fabrics to meet the constantly changing demands of consumers. Coating technology is an increasingly popular method for creating special designs and getting different appearance to denim fabrics. Depending on the expected properties from denim fabrics, the coating process parameters can be changed. The effect of process parameters on comfort properties of denim fabrics is important issue. The present study is focused on optimizing the various coating process parameters for the water vapor resistance properties of denim fabrics. In this study; the effect of process parameters such as squeeze pressure, the viscosity of the coating fluid, the fabric passing speed, drying temperature and weft density on the water vapor resistance of denim fabrics were investigated by using Taguchi method. An L27(35) orthogonal design was chosen as experimental plan. Initially, the denim fabric samples having 3/1 Z twill structure were manufactured with three different weft densities (14, 17 and 20 picks/cm). The coating of the denim fabric samples was performed by the Rotary Screen Coating Method, which based on the Taguchi experimental design. The same coating pat was used for the coating of the denim fabric samples. Water vapor resistance of the coated denim fabrics were evaluated according to the ISO 11092 standard, by using the Permetest device.

In the evaluations, analyses of variance (ANOVA) and the signal to noise ratio were used. According to Taguchi analyses, it was found that the most effective input parameter for water vapor resistance is weft density. Also, the combination satisfying minimum water vapor resistance was determined as 20 picks/cm weft density, 140 °C drying temperature, 50 dpas viscosity, 7 bar squeeze pressure, 10 m/min fabric passing speed.

Keywords: Denim, Coating, Taguchi Method, Water Vapor Resistance.

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COMBINED HEAT TRANSFER IN AN ENCLOSURE WITH DIFFERENT SIDE WALL GEOMETRY

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Abstract:

In this study, natural convection and surface radiation heat transfer in enclosures consisting of gray walls with different side wall geometries were investigated numerically. Vertical, triangular, and circular shaped right and left walls are considered. Two cases of heat input is considered due to isothermal wall from (1) the left side (2) the right side wall. The hot and cold walls are isothermal. The medium is filled with air, and it is considered as non-participating medium. The simulations are done using a two-dimensional and laminar flow model, and the Boussinesq approximation is applied to simulate buoyancy. The Rayleigh number and the surface emissivity are changed between Ra=10^4-10^7, and e=0-1, respectively. The numerical solutions are parametrically analyzed for modified side-wall geometries, different surface emissivity and Rayleigh number. The effects of the conduction-radiation parameter, the Rayleigh number, the surface emissivity and the geometry of the side-walls were examined for heat transfer and fluid flow properties.

Keywords: Different Side-Wall Geometry, Natural Convection, Surface Radiation

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COMBINED HEAT TRANSFER IN A SQUARE ENCLOSURE WTIH INTERNAL ENERGY SOURCES

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Abstract:

In this study, the effects of internal energy sources on natural convection and surface radiation heat transfer and flow structures in an enclosure are studied numerically. The vertical walls of enclosure are assumed to be heated differentially; the other walls are kept adiabatic. A Prandtl number of 0.71 has been used in non-participating medium. Emissivities of walls are same in cases considered. The momentum equations and energy equation with the Boussinesq approach are solving using the Finite Volume Method together with the Simple algorithm. The internal and external Rayleigh numbers were varied from 10^4 to 10^7, the surface emissivity is changed from 0 to 1. The effects of conduction-radiation parameter, the internal and external Rayleigh numbers and the surface emissivity on heat transfer and fluid flow properties were investigated. As a result, when the internal Rayleigh number is higher than external Rayleigh number and the other internal Rayleigh number is smaller than external Rayleigh number, two different flow patterns are observed and also heat transfer of hot and cold walls are changed considerably.

Keywords: Internal Energy Source, Natural Convection, Surface Radiation

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AN ANALYSIS OF OCCUPATIONAL INCIDENTS, PRIORITIZATION OF FACTORS CAUSING THESE BY USING MULTI CRITERIA DECISION MAKING METHODS AND IDENTIFICATION OF WAYS FOR REDUCING THESE: CASE STUDY IN OIL AND GAS FIELDS

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Abstract:

The aim of the Occupational Health and Safety studies conducted in the oil and gas sector is; to protect workers and to ensure occupational safety in works performed on drilling fields. The aforementioned studies of the companies operating in this field in Turkey are inadequate and are not given due importance to. In such companies, occupational incidents become inevitable for that reason. A vast number of studies have been conducted in many other countries around the world to reduce the number of occupational incidents, and those have led to a substantial reduction in those incidents. In Turkey, it is necessary to take measures to reduce the number of occupational incidents in the oil and gas sector. In this study, occupational incidents occurred in the company investigated as a case study and the other occupational incidents occurred in similar companies and the measures taken to reduce them have been discussed in detail. This study aims to explain what occupational incidents occur in the sector, what the root causes of them are and how to reduce the occupational incidents by taking measures.

Keywords: Multi Criteria Decision Making, Occupational Health And Safety, Chi Square, Occupational Incident, Petroleum And Natur

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NATURAL SPICES USED IN MERSIN (TURKEY)

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Abstract:

Spices were used by the Chinese Emperor Fo Hi 5000 years ago as medicine for the treatment of wounds and opening of the mind. The spices, which are old as human history, have been used in religious ceremonies for the next time in the production of mummification, dead burials and fragrance materials. Nowadays, spices are used primarily for cooking in daily life. The spice contains many different compounds such as resin and oil which contribute to the natural flavor of the spice as well as the aroma and pungency properties. Spice usage rates are naturally higher in countries where spices are grown. Our country is the one of the countries with the grown and use of spices. In addition to the delightful properties of spices, different phenolic substances in their compositions have been shown to have antioxidant, antimicrobial and anticarcinogenic properties by various scientific studies. The study emphasized that the spices consumed often by the local people of the city of Mersin. The study, attributes a review article, the studies had been done by Everest A et al., (2005); Esen B, (2008); Metin A (2009); Saday H, (2009); Sagiroglu M et al., (2013); Sargin SA, (2015) and Everest A et al., (2017) on spices in Mersin and its surroundings are considered. According to the present study, 23 taxa were identified as spices in the study area belonging to 17 different families. The most encountered families consumed as spices were Apiaceae (4 taxa), Lamiaceae (3 taxa) and Anacardiacae (2 taxon). Ethnobotanically, Mersin is rich in flora due to its geographical situation. As a result, spices still consumed in the city of Mersin (Turkey).

Keywords: Spices, Mersin, Turkey

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OPTIMIZATION OF COMPRESSIVE STRENGTH, TOTAL AND CAPILLARY WATER ABSORPTION OF PORTLAND CEMENT BASED MORTAR MIXTURES

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Abstract:

The effects of ground granulated blast furnace slag (GGBFS) and waterproofing admixture (WPA) on some engineering properties of Portland cement (PC) based mortar mixtures, such as compressive strength, total and capillary water absorption, were investigated within the scope of this study. Eight mortar mixtures and a control PC mortar mixture were prepared. Mortar mixtures were determined according to their three-level full factorial design. The replacement ratios of Portland cement with GGBFS were 10% and 20%. WPA was used at %1 and %2 ratios of total binder. Water/binder (w/b) ratio was kept constant as 0.44 for all mortar mixtures. Crushed limestone sand with a maximum particle size of 4 mm was used as fine aggregate. Mortar mixtures were prepared by using electrically driven Hobart mixer. Firstly, binder and crushed limestone sand were mixed for a minute in a dry state to achieve homogeneity. After that, the mixture of tap water and WPA was added gradually while mixing continued for about 3 minutes. Fresh mortars were casted into triplet steel molds. Mortar mixtures were demolded after 24 hours and cured in standard curing chamber until 28 ages. Compressive strength values were determined on cube specimens in size of 50x50x50 mm according to ASTM C349. Capillary water absorption and total water absorption mortar mixtures were determined on prismatic specimens in size of 40x40x160 mm according to ASTM C1403 and ASTM C642, respectively. The values obtained from experimental study were optimized by using Response Surface Method (RSM). Consequently, optimum mortar mixture ratios with desirable properties (the highest compressive strength value and the lowest capillary and total water absorption values) were determined.

Keywords: Waterproofing Admixture, Ground Granulated Blast Furnace Slag, Compressive Strength, Water Absorbtion, Response Surface Method

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DETERMINATION OF FLORFENICOL RESIDUE LEVELS IN THE SOME TROUT FACILITIES IN KARKAMIS DAM LAKE, SANLIURFA

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Abstract:

This study was aimed to detect florfenicol (FF) and its main metabolite florfenicol amine residue at edible tissue samples (muscles, liver and gill) and to assess the results in terms of food safety and public health. In this study, a total of 56 trout were used from five trout facilities located in the Karkamis dam lake in Sanliurfa-Gaziantep borders. Florfenicol residues in trout muscles, liver and gills were determined using high-performance liquid chromatography with a regulatory surveillance purpose. According to the results, concentrations of the antibiotic residues in fish muscle, liver and gills were 0.0577 ± 0.00929 ppm, 0.0598 ± 0.00978 ppm and 0.0862 ± 0.01658 ppm, respectively. The results showed that 14 of 56 studied samples (35 %) contained florfenicol. As a result of study mean florfenicol residue levels at edible tissue samples (muscles, liver and gill) collected from different areas were found lower than Turkish Food Codex residue limit (1000 ppm).

Keywords: Florfenikol, Residue, Dam Lake, Turkiye

[*]This study has been supported by the Harran University Scientific Research Projects Coordination Unit. Project Number: 16126.

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THE EFFECTS OF SEASON ON HEAVY METAL LEVELS IN RAINBOW TROUT FROM KARKAMIS DAM LAKE, SANLIURFA, TURKEY

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Abstract:

Heavy metals status of fish should be monitored in order to prevent water pollution. This study evaluates the effect of season on some heavy metal levels (Cr, Co, Zn, Fe, Cu, Pb and Mn) in rainbow trout (O. mykiss) (the liver, gill and muscle) in Karkamis dam lake of Sanliurfa/Turkiye. Fish samples (n=2017) were collected in four consecutive seasons in 2017. Total heavy metals were determined using Flame Atomic Absorption Spectrophotometer (FAAS) as ppm. The total levels of heavy metals (in ppm; mean±SE) found in the sampled trouts were as follows: in the spring, summer, autumn and winter, Cr (0.09±0.01), (0.07±0.03), (0.09±0.02) and (0.12±0.01); Co (0.05±0.003), (0.04±0.003), (0.04±0.002) and (0.04±0.002); Zn (26.18±2.95), (19.15±1.89), (19.47±2.71) and (19.63±2.30); Fe (29.04±3.65), (20.36±2.36), (26.21±2.34) and (28.96±5.82); Cu (25.35±4.53), (17.15±3.53), (18.40±3.26) and (22,68±4.77); Pb (0.02±0,002), (0.03±0.003), (0.02±0.003) and (0.04±0.01); Mn (1.48±0,19), (1.20±0.14), (1.20±0.13) and (1.29±0.08) respectively. The effect of season on Co, Fe, Cu and Fe levels was found to be significantly ($p<0.05$-$p<0.001$). At present, pollution level of heavy metals in the sampled fish is low according to FAO (1989) and poses no environmental problem with seasonal, yet, they have to be regularly monitored before they bio-accumulate into toxic.

Keywords: Heavy Metal, Trout, Accumulation, Turkiye

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SOME NEW TYPE OF SUMMABILITY METHODS IN TOPOLOGICAL SPACES

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Abstract:

The classical summability theory aims to make a non-convergent sequence to converge. Since many of the convergence methods need linear structure in the space studying the summability theory in an arbitrary topological space is not an easy issue. The concept of statistical convergence is one of the exceptional concepts of summability theory that can be considered in a topological space. There is a strong relationship between statistical convergence method and strong convergence method which is another interesting concept of summability theory. However, as the definition of strong convergence depends to the metric, studying similar relationship directly in arbitrary Hausdorff spaces is not possible. In this talk we introduce a convergence method which extends the notion of strong convergence to topological spaces. This new definition not only helps us to investigate a similar relationship in a topological space but also leads to study a new type of convergence in topological spaces.

Keywords: Summability Theory, Topological Base

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A FUZZY THEORITICAL SOLUTION FOR MULTI CRITERIA PROBLEMS THAT CONTAIN SUBCRITERIA

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Abstract:

Multi Criteria Decision Making (MCDM) is a process that ranks the alternatives or selects the best alternative under the conflicting criteria. Many researchers have focused on the fuzzy studies related to the varied MCDM methods in order to obtain more realistic results since the concepts of decision making under fuzzy environments were proposed by Bellman and Zadeh. Today, we meet numerous fuzzy- based MCDM studies. A part of these studies deals with the fuzzy measure that is used as a tool to identify the weights of the criteria in many MCDM methods. It is known that a fuzzy measure produces more factual results than additive ones. Thus, identification of a particular fuzzy measure is an important issue. In this talk, we give the general structure and properties of a particular type of fuzzy measure which models multi criteria decision making problems that contain subcrieria. For this purpose, after constructing the general form of the non-additive set function we deal with the interaction coefficient, Mobius representation and dual measure related to proposed measure.

Keywords: Fuzzy Measure, Multicriteria Desicion Making, Mobius Representation.

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DIGITAL FORENSICS IN SYSTEMS WITH AUTONOMOUS BEHAVIOR

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Abstract:

Digital forensic is a multidisciplinary study area dealing with the process of scientific investigation on evidence that can provide information to clarify the incident. It constitutes principles and standards for the collection, storage, compilation and analysis of evidence, usually obtained as data, through information systems. There have been many debates and issues digital forensic and its implications on both private and criminal law in last decade regarding obtaining and defining the source, understandability and reliability of the evidence and so on. The both parties a law case in trial or under investigation are human. Autonomous and intelligent systems are defined as systems that aware and interact with their environment. These systems are developed to enhance human capabilities, to assist in humans in repetitive tasks or to overcome handicaps and to replace humans in certain tasks. The types of autonomous and intelligent systems include unmanned robots, vehicles such as UAVs, driverless cars, UUVs. All these systems show autonomous behavior in a defined or certified level of autonomy. In case of any incident, accident or a legal case where a robot or a system with autonomous behavior involved, one of the parties or both parties may not be humans. Pending a case and reaching to a verdict in such situations may be extremely difficult. In this paper, we investigate and discuss the possible scenarios that systems with autonomous behavior involved.

Keywords: Autonomous Systems, Digital Forensic, Law, Ethics

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A FUZZY CLUSTERING BASED DECISION SUPPORT SYSTEM FOR ROLE DISTRIBUTION IN SOFTWARE PROJECT MANAGEMENT

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Abstract:

Previous researches reports that there are many correlations between personality factors and software engineering that personality preferences have great impact on motivation and the quality of work. Forming team members or incorporation of a new member into the team that currently working on a software project directly affects the project team's work performance and hence the progress of the project. In this study, a decision support system is suggested for establishing software project teams to improve their performances so that members can be assigned to teams by taking into consideration of their personality traits which are expressed in person's soft skills. The proposed decision support system aims to allocate team members based on their hard and soft skills where the system analyzes the personality traits of the project team members and associates the analysis results with individual software qualifications. The decision support system uses fuzzy clustering to associate team members according to their personality traits and technical skills. Myers-Briggs Type Indicator® (MBTI®) Short International Personality Item Pool – Neuroticism, Extraversion & Openness' (IPIP- NEO) personality inventories were used to associate soft skills and to help creating relationship between soft and technical skills. Proposed system is tested to group software engineers as team members for appropriate roles based on their personality types and skills at a medium sized software company with 88 participants where 51 out of 88 of participants were software developers and 37 out of 88 were system analysts. We grouped software engineers for appropriate roles based on their personality types and skills.

Keywords: Decision Support, Fuzzy Clustering, Software Project, Team Performance

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SHIP BALLAST TANK SEDIMENT MANAGEMENT: TURKEY PERSPECTIVE

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Abstract:

Sediments normally found deposited on the bottom of ballast tanks of ships are soft substances like wetpowder that consist of very small pieces of solid materials (sand, silt, clay, et al.). They are admitted with ballast water during the ballasting of a ship, along with native species existing in the area of the ballast water uptake. The accumulation of sediment in ballast tanks can cause many problems such as the transport of invasive species, tank corrosion and cost increase in ship operation. All ships must deliver dispose of sediments to shipyard at their annual or intermediate survey. The International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM Convention) was adopted by consensus at a Diplomatic Conference held at International Maritime Organization (IMO) Headquarters in London on 13 February 2004. A number of guidelines have been developed to facilitate the implementation of the convention. The BWM Convention is divided into articles and an annex, which includes technical standards and requirements in the regulations for the control and management of ships' ballast water and sediments. According to the BMW Convention, "All ships shall remove and dispose of sediments from spaces designated to carry ballast water in accordance with the provisions of the ships' ballast water management plan". Total 77 shipyards are operated in Turkey. Half of them receive sediments but they don't have well organized management plan. The BWM Convention is into force at September 7, 2017. Therefore, all shipyards have to clean or repair their ballast tanks, adequately built and safely operate, collect and dispose of sediments. Considering ship ballast tank sediment management, authors discussed sediment reception facilities and shipyards in Turkey and prepared "Sediment Management Plan" for these shipyards in this study.

Keywords: Ballast Water, Management, Sediment, Ship, Turkey

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PRODUCTION OF GEOPOLYMER BUILDING MATERIAL FROM FLY ASH (AN INDUSTRIAL SOLID WASTE) USING SODIUM HYDROXIDE AND SODIUM SILICATE MIXTURE

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Abstract:

Fly ash (FA) that is one of the industrial solid waste composed of fine particles is produced from coal-fired power plants. In Turkey, estimated amount of the FA is approximately 13 million tons per year. The aim of this study is to examine physical and mechanical properties of eco-friendly geopolymer building material produced using the FA provided by thermal power plant operating in Zonguldak (Turkey). Using the FA to produce geopolymer building material can help reduce the consumption of mineral reserves such as limestone and the emission of greenhouse gases. The main components of the FA are %42.12 SiO2 and %20.27 Al2O3. This FA is classified as low lime FA (F class) and considered as silico aluminous FA according to chemical composition. In the first experimental phase of this study, the sieve analysis, loose/tight unit weight and loss of ignition of the FA were obtained as well as the ultimate analysis. In the second phase, compressive strength, porosity, unit weight, water absorption percentage and radiation absorption tests were conducted on the FA-based geopolymer specimens activated by chemical binder (sodium hydroxide (NaOH) and sodium silicate (Na2SiO3) as 10% of the total amount of FA in terms of their weight, as 1/1, 1/2 and 1/3). While the compressive strength values were measured in the range of 7.9-9.9, 18.1-24.4 and 16.5-21.9 MPa, unit weight values were found as 1.38-1.41, 1.44-1.46 and 1.47-1.49 g/cm3 for the mixture incorporating 1/1, 1/2 and 1/3 ratios of NaOH/Na2SiO3 with the curing temperature at 70 °C for 7 and 28 days, respectively. However, water absorption and porosity values were determined around 20-35% and 30-45%. Depending on the geopolymer mixture with the maximum compressive strength values, the produced FA-based geopolymer samples can be efficiently used not only as wall material but also as C20 concrete. In addition to this, radiation absorption parameters of geopolymer building material will be presented.

Keywords: Environment, Fly Ash, Geopolymer, Industrial Solid Waste, Radiation Absorption

This study was a part of the project "Development of eco-friendly composite materials based on geopolymer matrix and reinforced with waste fibers" funded by the European Commission, within the 7th Framework Programme for Research and Technology Development (FP7), Topic #02: Waste management, recycling and urban mining (Project No. ELAC2015/T02- 0721) under the ERANet-LAC: Latin America, Caribbean and European Union and supported by a grant of the Turkish Scientific and Technological Research Council of Turkey (TUBITAK). The Turkish project number is 116Y549.

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ANALYSIS OF GENETIC POLYMORPHISM IN ZOM SHEEP

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Abstract:

The aim of this study was to molecular genetic characterization of Zom sheep breed raised in Turkey. The genetic polymorphism was detected by 8 Ramdom Amplified Polymorphic DNA (RAPD) markers in 18 sheep samples that collected from Karacadag district of Diyarbakir province. Of the 54 loci observed, 15 and 39 loci were found as polymorphic and monomorphic, respectively. Polymorphism rate for observed loci was calculated as 27.8%. All loci were found as polymorphic when using OPE-19 primers whereas no polymorphism was detected for OPE-02 or OPE-06 primers. The average values calculated for genetic similarity and genetic distances were 0.8970 and 0.1253, respectively. Genetic polymorphism along with genetic similarity and distance values indicated the diversity in Zom sheep.Populations, demonstrating high genetic variation, are decisive to provide opportunity and material for producing solutions to the problems of adaptation to environmental changes, diseases, and changes in consumer demands. The development of technologies related to genetic diversity, conservation and improvement is important also for sustainability of stockbreeding. Increase of genetic similarity in breeds and flocks cause reduction in variation and this also causes a decrease in genetic progress rate. Genetic polymorphism is expressed as the presence of diversity at genetic constitution of a population. Genetic polymorphism forms basis of the phenotypic variation.

The purpose of this study was to determine genetic diversity in Turkish native Zom sheep by RAPD-PCR method and so to share molecular genetic information for studies on breeding and improvement of this breed.

Keywords: Sheep, Zom, Genetic Polymorphism, Rapd

[*]*Yuzuncu Yil University scientific Research Projects Departmet*

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STATIC STABILITY ANALYSIS OF CLAY CORE ROCKFILL DAM

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Abstract:

Dams are structures that hold massive water volumes. This paper compares a Clay Core Rockfill (CCR) dam empty and full reservoir conditions for static stability assessment under hydrostatic effect. For this purpose, Duzcam CCR dam constructed in Karabuk, Turkey, is selected as an application. The Duzcam dam has 54 m height and 4430 decare irrigation area capacity annual. The unfavorable section of the dam is selected for two dimensional model. The dam model was constructed using the finite element method. The two dimensional finite element model of Duzcam CCR dam is obtained using Phase2 software. The material and soil mechanical properties were obtained from the experimental data of the dam. Base of model is fixed in horizontal and vertical directions and gravitational loading is applied. Duzcam dam was investigated to principle stresses and displacement throughout dam body height. For both cases, the stresses and displacements in the dam body were compared.

Keywords: Displacement, Duzcam Clay Core Rockfill (CCR) Dam, Finite Element Method, Principle Stresses

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BETA-GLUCAN USAGE IN ANIMAL BREEDING AND ITS ROLE IN THE IMMUNE SYSTEM

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Abstract:

Beta glucan is a polymer of D-glucose linked with glycosidic bonds at β (1 →3), β (1 →4), β (1 →6) and is typically found in the endosperm cell wall in oats, barley. Most of the β-1-3 linkages are insoluble, unlike the soluble β-1-4 linkages found in barley. Beta glucan is commercially derived from oats, barley, mushrooms and some microorganisms such as yeast. In recent years, potent stimulation effect of β-glucans on mammalian immune system have been found out. Many studies have been realized using fish, shrimp, pig, chicken and other experimental animals. Farm animals are exposed to many environmental stress factors and this causes to a weakened immune system. This weakened immune system makes the farm animals more susceptible to infectious diseases, resulting in serious economic losses. Many researches suggest that the immune systems are strengthening in farm animals fed with feeds containing beta-glucan and making them more resistant to diseases. β-1,3-glucanases are the enzymes that hydrolyze of β-1,3-glucan component found in the yeast cell wall and other β-1,3-glucans such as laminarin, curdlan and pachyman. Previously several β-(1,3)-glucanase genes have been cloned and expressed in several microorganisms for use in animal breeding.

Keywords: Beta-1,3-Glucanase, Immun System, Breeding, Enzyme Supplement

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INVESTIGATION OF FLOOD RISK FOR THE CASE OF ISTANBUL GURPINAR STREAM

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Abstract:

Recent decades devastating floods were increased with heavy rainfall events and most of the floods have more damages that cost of human lives than earthquakes as a result of global warming and human activities such as; unplanned urbanizations. Understanding of flood risk is a key step in managing the impacts of flooding. Therefore, it is significant to get meteorological data with field characteristics (slope, geological conditions, landscape usage etc.) and master plans of the site for flood risk managements. It is the fact that an accurate flood planning should be considerably managed. Therefore, it is essential to anticipate effects of flood damages to environment and people by determining with flood risk analysis and planning. As commonly known, Istanbul is the metropolitan city of Turkey in many ways that flood risk analysis should be preferably considered and planned for all streams that pass through the city. In the present study, flood planning and risk analysis were investigated for flood cross sections of Gurpinar stream that were considered to determine by Istanbul Water and Sewerage Administration (ISKI) for each cross- sections. Besides, flood discharges for critical cross-sections were determined with considering Synthetic Unit Hydrograph (SUH) and the others were calculated with using Rational Method. Flood elevations in the particular sections were simulated with DHI MIKE hydraulic model for computed flood discharges. It is seen that the critical sections were not sufficient to carry the corresponding flood discharges and flood areas were analyzed with MIKE hydraulic modelling. This study aims to investigate of flood risk analysis for Gurpinar Stream in Istanbul and determine the flood areas with using numerical modelling.

Keywords: Flood, Synthetic Unit-Hydrographs (Suhs) Method, Mike

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CONSIDERATION OF URBANIZATION IMPACT FOR SUSTAINABLE MODELING OF KAGITHANE RIVER FLOODS IN ISTANBUL

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Abstract:

Increase of floods peaks in urban area, because of structure measures can be reduced by adding some ecologic and biologic elements in river training that lead to sustainable management of the river floods. In this paper, impact of sustainable alternatives for Kagithane River floods in Istanbul metropole are presented. The aim of this study is to compare impact of detention ponds and grassed river trainning measures instead of exist concrete floodwalls to show their environmental, social and ecological priority. For this purpose, first, hydrologic and hydraulic model of the river is developed by using HEC-HMS and HEC-RAS Models (USACE) which are simulation models for rainfall-runoff and water surface profiles. First, the models used for exist condition with exist floodwalls, then by embedding urbanization and landuse change the increse in floods peak are shown. For long-term and sustainable flood management some possible alternatives related to ecologic and social characteristic of countryside of Istanbul, are proposed and are modeled in some scenarios. Finally, the flood hydrographs and flood map are calculated for the Kagithane River by the models. Afterwards, results of sustainable scenarios are compared with exist condition that show reduction of floods peaks significantly. Moreover, the socity and ecologic dimention of alternative increase creation area for Istanbul people that can be consider an important social and turism factor.

Keywords: Kagithane Floods, Hydrologic Model, Grassed Waterways, Detention Ponds

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CHARACTERISATION AND APPLICATION OF HYDROPHOBIC NANO LIQUIT GLASS FILMS BASED ON SILICA NANOPARTICLES

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Abstract:

Wetting state of a surface is characterized by the contact angle (CA). A surface with water contact angle greater than 90o is usually referred to as hydrophobic, and one with water CA higher than 150o is qualified as superhydrophobic. In this study, transparent and hydrophobic thin films are prepared on glass surfaces. Liquid SiO2 solutions produced by silicon-based nano- powder are covered on the glass surface by using spray method. Glass surfaces were coated at the room temperature in air with the different spray nozzles. Contact angle on the surface was measured by using with Drop Shape Analysis System contact angle meter. Scanning electron microscope (SEM) was used for investigating microstructure of the prepared surface. Roughness of surfaces, which was prepared on glass, was investigated using Atomic force microscopy (AFM). The deposition of nanoparticles and their clusters onto the substrates provide high roughness, which is essential for hydrophobic properties. Contact angle measurements of the prepared surfaces were obtained 121-143o and the SiO2 particles sticked to the fabric fibers as seen from SEM picture.

Keywords: Nano-Science, Nano Liquit Glass, Hydrophobic Property

[*]*"This study is supported by Councile Scientific Research Project of Necmettin Erbakan University"*

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THE EVALUATION OF STEM EDUCATION PRACTICES WITH 6TH AND 7TH CLASS STUDENTS AT SECONDARY SCHOOL

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Abstract:

STEM Education was called Science, Technology, , Engineering and Mathematics. Science, technology, engineering, and mathematics (STEM) are at center stage in the education reform movement. This educational method was to provide all students with thinking skills. It would make as a creative problem solvers students. It is perceived any student who participates in STEM Education, would have an advantage if they did attend college, particularly in a STEM field. This study was carried out to determine the effect of STEM practices which consists of fun science activities based on inquiry, coding and educational game-supported coding learning, on students' attitudes towards coding learning and the students' feelings and thoughts about the applications. The study was conducted for two weekends. The study group of the our STEM application is consist of 15 students at 6. and 7. grade students. STEM activities were carried out with all students' about motion and velocity. Data was collected by semi-structured interview. Data analysis was executed by content analysis. According to the results, participants mentioned that there is a relationship between science and technology, engineering, and mathematics. In these activities, students are developing curiosity, inquisitiveness, critical-thinking and problem-solving capacities which are built on through their school experience.

Keywords: STEM Based Activities, Qualitative Research, Phenomenology, Semi-Structured Interview

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STUDY ON MECHANICAL/THERMAL PROPERTIES AND FRACTURE BEHAVIOR OF PLA TOUGHENED WITH PBAT AND POSS

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Abstract:

Poly(lactic acid) PLA, an aliphatic, biodegradable and compostable thermoplastic polymer has been widely used in many applications in recent years due to its attractive properties such as relatively low cost, convenient physical properties and ease of manufacturing. Although PLA has greater tensile strength and stiffness than other biodegradable polymers because of its low fracture toughness causes significant problems in its use for some engineering applications. On the other hand, in most cases, fracture toughness must be regarded as one of the most important material characteristic because of the stress concentrating effect of micro- and nano-scale cracks which causes catastrophic failure well below the load bearing capacity of engineering materials. Thus, improving the fracture toughness of PLA is an important engineering problem. Polymer blending or alloying is one of the most used thermoplastic polymer modifying method because it allows obtaining a new material with the desired properties by combining the extraordinary properties of different materials. In addition, thanks to its flexible chemical properties, usage of polyhedral oligomeric silsesquioxane (POSS) as a compatibilizer has become an accepted practice in recent years. In this study, poly(lactic acid) (PLA) and its blends containing 30 wt% PBAT and 0.5 to 1 wt% POSS were mixed by using a twin-screw micro-compounder and then the melts were transferred to an injection moulding device to obtain standard test specimens. Fracture behaviors of composites were investigated by the essential work of fracture (EWF) method. Uniaxial tensile tests and differential scanning calorimetry (DSC) tests were also conducted to the materials for mechanical and thermal investigations, respectively. It was found from EWF tests that the incorporation of PBAT to the PLA matrix substantially improved the fracture toughness owing to greater energy absorption subsequent to maximum load on load displacement curves. POSS addition to the PLA/PBAT blend reduced the fracture toughness while increasing the slope of EWF lines. The tensile tests showed that the addition of PBAT decreased the tensile strength and increased the elongation at break.

Keywords: Biodegradable Polymers, PLA, PBAT, POSS, Mechanical Properties, Fracture Toughness.

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ESSENTIAL WORK OF FRACTURE TOUGHNESS ANALYSIS OF POLY(LACTIC ACID) THERMOPLASTIC STARCH BLENDS

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Abstract:

Synthetic polymers, majority of which derived from petrochemicals such as as polyethylene terephthalate (PET), polyvinylchloride (PVC), polyethylene (PE), polypropylene (PP), polystyrene (PS) and polyamide (PA) are resistant to degradation and disposal of these materials causes environmental problems. Therefore drive for the development of biodegradable polymers is an exigency. As an aliphatic, biodegradable polymer, Poly(lactic acid) PLA has a high potential to be very useful in many engineering applications owing to its better properties such as relatively low cost, convenient physical properties and ease of manufacturing than the others. On the other hand PLA has poor fracture toughness according to other widely used polymer materials. In this study PLA was blended with another biodegradable polymer thermoplastic starch (TPS) and fracture toughness of PLA/TPS blends was evaluated by using Essential Work of Fracture (EWF) method. PLA, TPS and PLA/TPS blends were mixed in a twin-screw microcompounder and then injection moulded to fabricate 2 mm thick rectangular shape EWF test specimens. Double edge notched tensile (DENT) specimens with various ligament length were tested at room temperature with a constant deformation rate. It was observed that the TPS has not a significant effect of PLA's fracture toughness. Moreover, neat PLA was found not to be a suitable material for the EWF method, because of its low fracture toughness.

Keywords: Biodegradable Polymers, PLA, TPS, Essential Work Of Fracture Method, Fracture Toughness

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DESIGN OF A NOVEL BIOSIGNAL MEASUREMENT SYSTEM FOR HUMAN-MACHINE INTERFACE AND HUMAN COMPUTER INTERFACE RESEARCHES

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Abstract:

The aim of this work is to design a new multi-channel biosignal measurement platform for use in human computer interface (HCI) and human machine interface (HMI) researches. The circuits for non-inverting amplifier, 50Hz notch filter, DC voltage drift, 4th order low pass filter, 2nd order low pass filter, DC coupling, instrumentation amplifier and optical isolation have been designed for biopotential signal measurements. A motherboard that will be used in the measurement of signals such as ECG, EOG, EMG, EEG and allowing the modules being manufactured in small size to be added one behind the other on it has been designed. The motherboard allows biosignal measurements from 16 channels in total and the signals obtained using the motherboard are transferred to the designed data capture system after being optically isolated. The analog data, the serial digital data, the optical data and the shared parallel digital data values have been transferred, for each channels, via this data capture system into the front panel of the developed platform. By using this modular platform, researchers working on HMI and HCI can make multiple signal analysis by creating different configurations for different biosignal measurement systems.

Keywords: Multichannel Biosignal Measurement, Human-Machine Interface, Human-Computer Interface, Signal Analysis

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EFFECT OF ADDITION FILLER TO PA 12 COATING

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Abstract:

Polyamide (PA) is a well-known engineering polymer. Having various types with different properties, PA exhibits superior physical and mechanical properties. Among them PA 12 has the lowest moisture absorption as well as higher abrasion resistance. These properties made them preferable coating material. PA 12 coating are widely used in wire products, automobile parts, medical supplies, pipelines and fittings and many industrial items. Improvement of these properties plays an important role on its application areas. To achieve this goal several types of fillers are used in plastics. In the present study, the influence of CaCO3 and TiO2 on the properties of PA 12 coating was investigated.

Low carbon steel plates were coated by tape casting method. PA12 powder with 26 µm and CaCO3 and TiO2 powder under 20 µm particle sizes were used. The Slurry prepared with ethanol and varying filler amounts were applied on steel substrate with 1 mm thickness and molten at 180°C under atmospheric conditions. The final thickness of the samples was measured by using profilometer around 400 µm. Scanning electron microscopy (SEM) was used for morphological investigations. Abrasion and surface roughness tests were also carried out on samples. Additionally mechanical tests as hardness and tensile tests were made to characterize the coating properties. Achieved results revealed that, different amounts of both CaCO3 and TiO2 additions as filler improved the properties. Moreover compared to CaCO3, TiO2 addition in coatings, showed better results.

Keywords: Pa 12, Coating, Tape Casting, Abrassion

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HELMINTHS AND PROTOZOA OF 2-6 MONTH OLD PUPPIES IN KONYA, TURKEY

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Abstract:

Stool samples of a total of 121 puppies, 2-6 month old age groups, were examined by native, Fulleborn's floatation and Benedek's sedimentation methods to determine the prevalence of gastro-intestinal helminth and protozoa infections in Konya province, Turkey. 92 (76,03%) stool samples were found positive in terms of the helminth and protozoan infections. Three protozoan cyst, oocyst and sporocyst were found in the infected stool samples. Giardia spp. cysts (2.48%), Sarcocystis spp. sporocysts (2.48 %) and Isospora spp. oocysts (26,45.%) were detected as protozoan parasites. Of the helminths causing gastrointestinal helminthiasis, three cestode and three nematod eggs were observed. Cestode eggs were identified as follows: Joyeuxiella spp. (1.65%), Dipylidium caninum (10,74%) and Taenia spp./Echinococcus spp. (0,83%). Nematodes were found to be more prevalent than cestodes. In this study, of the nematode eggs: Toxascaris leonina (33.06%), Toxacara canis (38,84%) and Physaloptera spp. (6,61%) were detected, respectively. However, no trematode eggs were detected. Mono and mixed infections were seen in this study. Mono, dual and triple infections rate in infected stool samples were determined as 47,82%, 43,48% and 7,61%, respectively. In a stool specimen (1.09%), one protozoa cyst and three helminth eggs were detected together. Isospora spp., T. leonina, T. cati and Dipylidium caninum were found in this specimen.

Keywords: Dog, Puppy, Helminth, Protozoa, Konya

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HELMINTHS OF DOMESTIC EQUIDS IN A FARM IN ESKISEHIR, TURKEY

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Abstract:

Stool samples of a total of 110 horses (97 female and 13 male), between 1 and 19 years old Arabian and British horse were examined by Fulleborn's floatation method, Benedek sedimentation method and Baerman Wetzel methods to determine the prevalence of gastro-intestinal helminth and protozoa infections in Mahmudiye, Eskisehir province, Turkey. 84 (76,36%) stool samples were found positive, in terms of the helminth infection. While Arabian horses' infection rate was 81,01 % (64 of 79), British horses' were 64,52 % (20 of 31). Totally, of the helminths causing gastrointestinal helminthiasis only nematod eggs were observed. In this study, of the Arabian horses' nematode eggs Parascaris spp. 37,97% (30), Strongylus spp. 74,68% (59) and British horses' nematode eggs Parascaris spp. 22,58% (7) and Strongylus spp. 64,52% (20) were detected, respectively. In this study, Arabian horses were found to be more infected than British horses. However, no trematode eggs and Metastrongylidae spp. larvae were detected.

Keywords: Horse, Helminth, Strongylus, Parascaris, Turkey

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INVESTIGATION OF THE SUBSTRATE EFFECTS ON THE MECHANICAL PERFORMANCE OF YBCO COATING PRODUCED BY VACUUM EVAPORATION TECHNIQUE

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Abstract:

Since the discovery of high temperature superconductivity (HTS) of Yttrium Barium Copper Oxide(YBa2Cu3O7-δ), numerous studies have focused on this issue in order to improve its superconducting characteristics and mechanical properties. Nowadays, the superconductor materials have various technological areas such as intensively using magnetic resonance imaging (MRI) in medicine, energy storage systems in transformers, magnetic seperators, nuclear magnetic resonance (NMR), generators, engine cables, superconducting wires and tapes, accelerators, electronic transistors and electromagnets. In this study, the effects of magnesium oxide (MgO), sapphire and yttria stabilized ziconia (YSZ) substrate materials on the Yttrium Barium Copper Oxide(YBCO) coating performance as mechanically were investigated. Nanoindentation method is used for characterization of coating and substrate material. The hardness values and modulus of elasticity of the YBCO thin films were measured to indicate the effects of substrate materials on the mechanical properties . Also, the structural properties of the thin films was examined with X-ray diffraction technique and surface morphologies of thin films were investigated with scanning electron microscopy(SEM).

Keywords: YBCO, Thin Film, Vacuum Evaporation Technique, Nanoindentation

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FINITE ELEMENT SIMULATION OF THE SUBSTRATE EFFECTS ON THE MECHANICAL PERFORMANCE OF YBCO-BASED SUPERCONDUCTOR THIN FILMS

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Abstract:

Superconductivity has been a main topic of interests and have been investigated on various types of materials consisting high temperature superconductors. The paper deals with the numerical simulation of the mechanical characteristics of YBCO-based superconductor thin films produced by vacuum evaporation technique with different substrates are identified with finite element method(FEM). Numerical methods provide a suitable technique for analyzing nanoindentation experiments when multiple layers are present. Elastic properties and limit (E and yield stress) of YBCO thin film and substrate materials were designated by using finite element technique which was performed with the commercial finite element software package ABAQUS and nanohardness experiments. ABAQUS identifies contact between two bodies in terms of a contact match with two surfaces named the master surface, and the slave surface. In order to achieve a flexible and reproducible model, the indentor, the coating and the substrate material properties as well as the penetration depth are variable and changing parameters. The simulation of the nanoindentation test has been performed considering two load steps. The first load step, the so-called loading stage, represents the indentation phase into the coating. During the second load step, the so-called relaxation stage, the indentor cone is removed, leading to a material elastic-plastic recovery. The datas calculated by FEM analysis are compared with the experimental results obtained from nanoindentation tests. In addition, failure characteristics of films were obtained using a different algorithm with FEM.

Keywords: YBCO Based Thin Film, Vacuum Evaporation Technique, Superconducting Properties, Nanoindentation, Finite Element Analysis

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THE PENTAGRAM SHAPED PATCH ANTENNA DIMENSION ESTIMATION

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Abstract:

The microstrip patch antenna is a popular printed resonant antenna for narrow-band microwave wireless links that require semi-hemispherical coverage. Although it has various advantages like being easy to produce, standing with own electronic circuit on the same PCB, having high adaptivity, etc., having a narrow bandwidth is the most important disadvantage. Even if there are some methods like "creating notches or adding grounding pins" which make patch antenna bandwidth wider, the antenna should be designed with the operating frequency very close to the antenna resonance frequency. This situation poses that the dimensions of patch antenna need to be determined with more precision. In this study, a basic formulation has been obtained in order to determine the Pentagram shaped patch antenna dimensions for an aimed working frequency. In the calculations of patch antenna working frequency, the openEMS library has been used. The openEMS is a free and open electromagnetic field solver using the FDTD method. Octave is used as scripting interface. As the result, the proposed formulation calculates the dimensions of Seljuk Star patch antenna with the accuracy of %3.72 for a specified working frequency.

Keywords: Patch Antenna, Seljuk Star, Dimension Estimation, Empirical Formulation

[*]*This study is supported by Scientific Research Projects Ofiice of Necmettin Erbakan University*

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COMPARISON OF MACHINE LEARNING METHODS PERFORMANCES IN WORKING FREQUENCY AND WAVELENGTH ESTIMATION OF PENTAGRAM SHAPED PATCH ANTENNA

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Abstract:

Microstrip or patch antennas are becoming increasingly widespread within the mobile phone or mobile devices market due to the fact that they can be printed directly onto a circuit board. Patch antennas are low cost, have a low profile and are easily fabricated. In this study, working frequency of pentagram shaped patch antennas that have various dimensions, have been simulated by using openEMS scripts. The openEMS is a free and open electromagnetic field solver using the FDTD method. Octave is used as scripting interface. A dataset which is consisted of dimensions of the patch antenna, the dielectric constant of the used material, the determined working frequency which has been obtained by openEMS simulations, and wavelength of determined working frequency, has been prepared. This dataset has been investigated by using WEKA software which supports various Machine Learning algorithms. By employing various machine learning methods, estimation of working frequency and estimation of working frequency wavelength has been performed respectively. And estimation performances of the machine learning methods in both class has been compared.

Keywords: Patch Antenna, Pentagram, Frequency Estimation

[*]*This study is supported by Scientific Research Projects Ofiice of Necmettin Erbakan University*

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INFLUENCE OF NANO-CELLULOSE ON STATIC MECHANICAL PROPERTIES AND AGEING PROPERTIES OF EPDM RUBBER

Ayhan Tozluoglu[a*], Bayram Poyraz[a], Sibel Dikmen Kucuk[a], Yusuf Guner[a], Umit Buyuksari[a],Halil Ibrahim Sahin[a]

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Abstract:

Nano based materials have been used in many applications. Lately, nanocellulose with different kinds have attracted much interest in the industry. In this study, Nano fibrillated cellulose (CNF) based EPDM rubber were produced via the hot press molding technique in the wake of rubber mixing mill. For that purpose, EPDM (ethylene ptopylene diene) terpolymer and CNF was mixed in the presence of filler and accelator. Mechanical and Aging test on the rubber were carried out with universal testing machine and thermal ageing oven, respectively.

In the end of the study, the weaker tensile strength and elongation were observed whereas the closer short hardness and tear strength were determined. In addition, permanent deformation increased with the increase of CNF. However, all of the obtained values are in the standart value range. In the present study, it was observed CNF can be used in the EPDM rubber. However, it should be increased the CNF ratio in order to obtain higher static mechanical value.

Keywords: Epdm Rubber, Nano Fibrillated Cellulose, Static Mechanical Properties, Ageing.

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INFLUENCE OF NANO-CELLULOSE ON CHEMICAL, THERMAL, MORPHOLOGIC AND RHEOLOGICAL PROPERTIES OF EPDM RUBBER

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Abstract:

Biopolymer based materials have attracted much interest due to environmentally concern. Therefore, a number of studies have been carried out related to biopolymer based materials. In this study, nano fibrillated cellulose (CNF) based EPDM rubber was produced via the hot press molding. Chemical, thermal, morphological and dynamic rheological properties were investigated with Fourier Transform Infrared Spectroscopy (FT-IR), thermogravimetric analysis (TGA), SEM and Moving Die Rheometer, respectively. It was observed that CNF-EPDM rubber were successfully produced. No significant new vibrations regarding the CNF- EPDM rubber were observed. The CNF enabled lower thermal stability in the CNF-EPDM rubber and it was uniformly distributed as well as no considerable agglomeration. In the rheological analysis, the CNF lowered viscosity value and ensured higher scorch time.

It can be concluded that CNF can be propably used with EPDM terpolymer for EPDM rubber in the profile production.The CNF enabled lower thermal stability in the CNF-EPDM rubber and it was uniformly distributed as well as no considerable agglomeration. In the rheological analysis, the CNF lowered viscosity value and ensured higher scorch time. It can be concluded that CNF can be propably used with EPDM terpolymer for EPDM rubber in the profile production.

Keywords: CNF; EPDM Rubber; Rheology

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MANAGEMENT AND ASSESSMENT OF WASTE GENERATED BY MARBLE MINING IN TURKEY

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Abstract:

Marble is decorative and building materials having durable, long lasting and aesthetic properties and plays an important role in the economy of several European countries. Many rich marble deposits in countries like Portugal, Spain, Italy, Greece, Turkey, Iran and Pakistan are located in Alpine-Himalayan belt. As a result of its location in this zone, Turkey has almost 40% of the total marble reserves (13.9 billion tonnes) of the World with 5.2 billion tonnes (World's 7th largest producer of marble) in approximately 650 colors and patterns.

Marble production has generated a considerable amount of waste materials; almost 70% of this mineral gets wasted in the mining, processing and polishing stages which have a serious impact on the environment like water pollution, land degradation, gas emissions, solid waste, dust and noise. Marble waste is a kind of industrial waste that must be carefully managed in terms of both quantity and characteristics. Integrated waste management is based on hierarchy that emphasize to reusing and recycling. Reuse or recycling of wastes reduces the usage of limited natural resources and prevents environmental degradation, increases production efficiency and minimizes environmental problems that can occur as a result of waste deposit. Due to the widespread use of calcium carbonate as raw material in a number of industrial fields, the recovery of marble waste and its processing in a marketable product is nowadays gaining an economical interest. In some applications in the World and in the literature, marble waste is evaluated in many industries such as construction, automotive, ceramics, cement, paint, glass, paper, agriculture, feed and plastic.

Implementation of environmentally-friendly practices lead to Turkey achieve sustainable development goals faster and increase international competitiveness in industrial sector. In this study, some important information on management and assessment of waste generated by marble mining in Turkey are given in detail.

Keywords: Environment, Marble Waste, Mining, Waste Management, Turkey

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LIFE CYCLE ASSESSMENT OF BUILDING INDUSTRY: A REVIEW

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Abstract:

Buildings play an important role in consumption of energy all over the world. The building sector has a significant influence over the total natural resource consumption and on the emissions released. A building uses energy throughout its life from its construction to its demolition. The social, economic and environmental indicators of sustainable development are drawing attention to the construction industry, which is a globally emerging sector, and a highly active industry in both developed and developing countries. Life cycle assessment (LCA) that is a tool for systematically analyzing environmental performance of products or processes over their entire life cycle includes raw material extraction, manufacturing use, and end of-life disposal and recycling. LCA methodology is based on the ISO 14000 series of international standards. LCA has been used not only in the building sector since 1990 but also to assess product development processes from cradle to grave for many years. With the current push toward sustainable construction, LCA has gained importance as an objective method for evaluating the environmental impact of construction practices. LCA studies show that cement production is a major contributor to carbon dioxide emissions. In this study, history, methodology and applications of LCA in building sector are given.

Keywords: Building Industry, ISO 14040, Life Cycle Assessment, Sustainable Development

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ISOLATION OF FEED ADDITIVE LICHENASE PRODUCING BACTERIA AND PARTIAL CHARACTERIZATION OF THE ENZYME

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Abstract:

In the present study, β-(1,3-1,4)-glucanase (lichenase) producer Bacillus sp. HY3 was isolated from the soil samples collected from Osmaniye, Turkey. The enzyme showed its optimum activity at 60 ºC and 6.0-7.0 pH values. While the enzyme was quite stable between 40-80 ºC with the rate of 89.8%, it showed 73% residual activity after pre-incubation at 80 ºC for 15 min. The strain Bacillus sp. HY3 reached its maximum enzyme production after 36 hours after inoculation time. The molecular weight of the enzyme was determined as 83 kDa via SDS-PAGE and zymogram analysis. The activators for the enzyme were MgCl2, CaCl2, EDTA, MnCl2 and FeCl3, whereas the inhibitors were HgCl2, ZnCl2, CuCl2 and CoCl2 at different rates. The enzyme may be appropriate for industrial application because of its thermo-stability, optimum temperature and pH values, and its increased activity by certain chemicals. However, the enzyme can be made more suitable for industrial applications using molecular techniques such as cloning and mutagenesis.

Keywords: Bacillus Sp., B-(1,3-1,4)-Glucanase, Lichenase, Isolation, Characterization

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INVESTIGATION OF RECOMMENDER SYSTEMS ON ONLINE ADVERTISING DOMAIN

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Abstract:

Online advertising continues to show strong growth since 2010. In 2016, its revenues hit to $72.5 billion in the United States and $550 million (1.9 billion TL) in Turkey. Because of this massive size of the revenues, most of the online advertising companies aggressively try to improve their targeting techniques to get a bigger slice of the cake.

Contextual targeting is widely used techniques to increase the effectiveness of online advertising delivery. Another way to improve the efficacy is behavioral targeting, which covers a range of methods that based on consumers' online behaviors.

In this work, we identified some issues which both contextual and behavioral targeting can't answer. Then, we applied the existing state-of-art collaborative filtering techniques on an online advertising data set, which contains anonymous consumers' web browsing history and their interactions against advertisements. The performances metrics, including recall, precision, and F1 score, are measured for each technique by k-fold cross-validation.

Results show that user based collaborative filtering performs slightly better than other examined techniques and introducing this kind of recommendation techniques into the targeting mechanisms positively affects the matching between advertisements and targeted consumers.

Keywords: Online Advertising, Behavioral Targeting, Recommender Systems, Collaborative Filtering

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INVESTIGATION OF THE FACTORS AFFECTS THE COGGING TORQUE OF THE SURFACE MOUNTED PERMANENT MAGNET SYNCHRONOUS MOTOR

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Abstract:

The use of electric motors in industrial fields is very desirable. In this context, until today the most frequently used electric motors are DC motors, induction motors, synchronous motors and others respectively. With the discovery of permanent magnets with high magnetic properties in the 1980s, the use of permanent magnet synchronous motors has increased. Performance factors such as high power density, high efficiency and good driver influence this situation. However, disadvantages such as magnet and drive costs and torque fluctuation components are also weak points of permanent magnet synchronous motors.

There are two types of torque fluctuation in permanent magnet synchronous motors: torque ripple and cogging torque. Torque ripple depends on the characteristics of the motor drive, while cogging torque is a design problem related to the motor structure. It is stated in the literature that air gap reluctance change is effective in producing cogging torque. The air-gap reluctance change of the motor is determined by the interaction between rotor magnetic poles and stator slot opening. For this reason, cogging torque can be reduced by selecting the appropriate design model and parameters in permanent magnet synchronous motors.

In this study, the change of the cogging torque due to the rotor pole and the stator slot opening of the surface mounted permanent magnet synchronous motor was investigated. For this, different designs related to the electrical angles, remanence flux density values, relative permeability of the magnets and stator slot opening, relative permeability of the stator have been investigated. The obtained finite element analysis results are presented in graphics and tables. The most effective design parameters for reducing the cogging torque were obtained.

Keywords: Cogging Torque Analysis, Finite Element Method, Permanent Magnet Synchronous Motor

[*]This study is supported by The Coordinator of Scientific Research Projects of Necmettin Erbakan University

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AN APPLICATION OF THE SIMULATED ANNEALING ALGORITHM TO THE EXTERNAL PM MOTOR DESIGN

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Abstract:

Today, the use of permanent magnet synchronous motors (PMSM) in the industry has increased considerably due to improvements in drive systems and permanent magnet technology. Permanent magnet synchronous motors have advantages such as high efficiency and high torque/volume compared to other electric motors. However, the designs of PMSMs are very complicated due to nonlinearities. The use of artificial intelligence algorithms is very common in nonlinear engineering problems. These algorithms try to find the most appropriate result parameters by randomly selecting the input parameters in a large solution space. The impressive factor here is the chosen objective function. This study aims to optimize the outer rotor PMSM design by the simulated annealing algorithm. The selected artificial intelligence method is an algorithm based on iron annealing which is frequently used in optimization problems. The objective function is the efficiency of the motor.

The examined motor has stator slots and pole numbers are 12 and 10 respectively. The winding layout is concentrated winding with double layer. The variables are rotor inner diameter, magnet thickness, air gap length, slot wedge height, stator tooth width, stator slot height, ratio of the slot opening over the slot width. Stator diameter, stack length, pole angle are invariables and their values are 340mm, 120mm, and 126°, respectively. Supply, power and speed of the motor are 340V, 2400W, and 250rpm. The permanent magnets have 1.2T flux density. Population and iteration numbers are 100. The algorithm terminates by the iteration number and so each run was repeated 5 times and the running results that obtain the high efficiency value were taken. Copper loss for analytical design is 131.6 watts and iron loss is 40 watts. The copper loss for the optimization design is 88.8 watts and the iron loss is 43.1 watts. Analytical and optimization efficiency results are 93.33% and 94.79%. The improvement in motor efficiency is quite impressive. This indicates the usefulness of the study and particularly the effectiveness of the algorithm.

Keywords: External Rotor, Simulated Annealing Algorithm, Permanent Magnet Synchronous Motor Design

[*]This study is supported by The Coordinator of Scientific Research Projects of Necmettin Erbakan University

ICENS 4TH INTERNATIONAL CONFERENCE ON ENGINEERING AND NATURAL SCIENCE
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PROBING THE ANOMALOUS MAGNETIC AND ELECTRIC DIPOLE MOMENTS OF THE TAU LEPTON AT THE MUON COLLIDERS

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Abstract:

In this study, the anomalous magnetic and electric dipole moments of the tau lepton in the \mu^{+}\mu^{-} \rightarrow \mu^{+}\gamma^{*} \gamma^{*} \mu^{-}\rightarrow \mu^{+}\tau \bar{\tau}\mu^{-} process at the future muon colliders at the center-of-mass energies of 1.5, 3 and 6 TeV are investigated. In addition, the bounds at the 95\% confidence level (C.L.) on the the anomalous magnetic and electric dipole moments of the tau lepton using different integrated luminosities 125, 440 and 1600 fb^{-1} via effective Lagrangian method are estimated. Our numerical results show that the best bounds obtained on the anomalous a_{\tau } and d_{\tau } couplings at the center-of-mass energy of 6 TeV and an integrated luminosity of L_{int}=1600 fb^{-1} are [-0.00338; 0.00121] and [-7.05;7.05] x10^{-18} (e cm). Thus, it is shown that the $\mu^{+}\mu^{-} \rightarrow \mu^{+}\gamma^{*} \gamma^{*} \mu^{-}\rightarrow \mu^{+}\tau \bar{\tau}\mu^{-}$ at the future muon collider process leads to a remarkable improvement in the existing experimental bounds on the anomalous magnetic and electric dipole moments of the tau lepton.

Keywords: Tau Lepton, Muon Collider, Electric And Magnetic Moment

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ELECTROTRANSFORMATION OF BETA-(1,3-1,4)-GLUCANASE (LICHENASE) GENE INTO BACILLUS SUBTILIS RSKK246 STRAIN

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Abstract:

β-Glucan is a major component of the cell walls of cereals such as oats and barley. 1,3-1,4-β-D-glucan 4-glucanohydrolase (β-glucanase; lichenase) (E.C. 3.2.1.73) hydrolyzes β-glucans via from β-1,4 glycosidic bonds on 3-O-substituted glucosyl residues. In this study, the recombinant vector pNW33N carrying the beta (1,3-1,4) glucanase (lichenase) gene of Streptococcus bovis genome was transferred into Bacillus subtilis RSKK246 (CMCase+) strain via electroporation. Xanthic activity zones of recombinant B. subtilis RSKK246 colonies after Congo red staining were observed after electrotransformation on LB-agar plates containing lichenan as substrate. Besides, the DNA band of lichenase gene (1800 bp) obtained from recombinant vector pNW33N/Lichenase after digestion by both Bam HI and Hind III restriction endonucleases was observed on agarose gel. On the other hand, total extracellular proteins of recombinant B. subtilis RSKK246 strain were compared to counterparts of wild type strain. Finally, the activity protein band of recombinant enzyme were observed after zymogram analysis referring to 26 kDa. These results suggest that β-(1,3-1,4) glucanase gene was successfully expressed in B. subtilis RSKK246 strain.

Keywords: Bacillus Subtilis, B(1,3-1,4) Glucanase, Electroporation, Probiotic

[*]*This study was supported by Scientific Research Projects Coordination Unit of Cukurova University*

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USE OF A VERTICAL TAKE-OFF AND LANDING (VTOL) UNMANNED AERIAL VEHICLE (UAV) IN THE CONTROL OF HIGHWAYS

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Abstract:

Unmanned Air Vehicles (UAVs) are popular and well known air vehicles. Vertical take-off and landing (VTOL) UAVs are hybrid air vehicles. Those can also take of like a helicopter and fly like an aircraft. This combines the superiority of the helicopter take-off with the efficient and fast flight of the aircraft. This paper focuses on a VTOLUAV that used in the control of highways. By using this VTOLUAV in the highways; road construction works, traffic jam, data of traffic accidents, road defects and so on could be detected. The VTOLUAV is used to take images of road constructions. The taken images are processed and discussed in this paper. The processed images are taken by the VTOLUAV while the construction process of the road. The map of differences of the taken images is calculated by the algorithm. This map is used to find the changes of the construction area. In this way, every stage of road construction works is controlled. Also the design and build phases of the VTOLUAV are presented in this paper.

Keywords: Image Processing, Unmanned Aerial Vehicle, UAV, Vertical Take-Off And Landing, Vtol

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A NOVEL OPTIMIZATION ALGORITHM; FOX HUNTING ALGORITHM (FHA) AND ANTENNA ARRAY PATTERN SYNTHESIS APPLICATION

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Abstract:

An efficient and fast optimization algorithm named Fox Hunting Algorithm (FHA) is presented here. FHA is a general-purpose population-based search algorithm. FHA can be used to solve many optimization problems. There are many algorithms in the literature that mimic animal and plant behavior. But human is the most intelligent living entity in the world. The human uses the superiority of animals for hunting. The FHA algorithm mimics the fox hunting activity which is formed and improved since 16th century by the human. In this study, FHA is applied to pattern synthesis problem of linear antenna arrays with the prescribed nulls. Antenna pattern synthesis of linear antenna arrays is a well-known hard problem of electronic engineering. Antenna pattern synthesis is achieved by controlling only the amplitude of each array elements. Some numerical examples of Chebyshev pattern with nulls applied at interference directions are given to show the efficiency and flexibility of the FHA.

Keywords: Fox Hunting Algorithm, FHA, Amplitude Only Pattern Nulling, Antenna Pattern Synthesis, Optimization

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AN ACTION MANAGEMENT SYSTEM FOR CYBER FRAUD PREVENTION

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Abstract:

Today, people's lives have become connected to the Internet at every moment with the increase in the usage of computers and then mobile devices. Many operations (banking, tax, stock market) can be implemented by Internet.This situation brings a lot of benefits to mankind but it also has serious risks in security. Not only people but also companies are affected from this situation. It is known that malicious uses in cyber world are rapidly increasing. Those who have taken up this business and seek openly in the systems give material damage to both people and companies.

Detecting fraud in finance, telecom, online shopping and many other sectors is a very imortant subject in information technologies. While there are millions of transactions in any systems, fraud detection systems try to distinguish them and take the necessary actions. Serious time and effort are required for the follow-up and blocking of these cases.

In this study, it is aimed to help the fraud detection systems to follow the fictions with automatic workflows and follow them according to the user's next movements.

Thus, both users and companies will be protected from damages caused by 3rd persons in situations such as payment difficulties that can occur. An action management system will be developed to ensure that actions that need to be automatically taken for workflows are processed correctly and securely.

Keywords: Action Management System, Cyber Fraud Prevention

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PERFORMANCE COMPARISON OF WEBAPIS IN DIFFERENT PLATFORMS

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Abstract:

Today, the number of transactions that can be done on the internet day by day, and therefore the number of devices that can connect to the internet is increasing. Many important operations can be performed on the Internet, from official transactions to banking transactions, from online shopping to distance learning. Of course, this convenience also brings with it several disadvantages. Some of these are compatibility issues with different devices, scalability problem, security problem, workload problem. New technologies are constantly being developed to solve each of these problems. The Internet of Things (IOT) is a popular technology that allows people to access the Internet of a system we use today for any purpose. Ever since the introduction of this technology, it has become more and more important to solve the problems mentioned above, and web application programming interfaces (WebAPIs) are often used. Because, WebAPIs provide most of the communications between IOT devices, protocols and other elements. So, measuring the speed, performance, compatibility and scalability of WebAPIs have become increasingly important. WebAPIs can be developed in different computer language platforms depending on the applications, projects, modules, devices used and the purpose of use. However, there is no specific rule or standard about which programming language and platform to develop an WebAPI.

Accordingly, determining in which language and platform WebAPI performs better will be beneficial for software projects. In this paper, WebAPIs will be developed using different programming languages and platforms and performance will be compared according to various criteria. In this way, the factors that will increase the performance of the WebAPI will be determined.

Keywords: Webapi, Internet Of Things, Performance Analysis

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ISOLATION AND IDENTIFICATION OF AEROMONAS SOBRIA IN YELLOWTAIL CICHLID, PSEUDOTROPHEUS ACEI

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Abstract:

In this study, Aeromonas sobria was isolated from yellow tail cichlid, Pseudotropheus acei (mean weight. 6 gr) in an aquarium. The disease occurred in June 2017. The cumulative mortality was cakculated as 74.6 % at 26oC. Infected fish exhibited lethargy, abdominal swelling, lack of appetite and erosion in the the caudal fins. Internal findings included accumulation of ascitic fluid in the abdominal cavity, enlarged and molten kidney, enlarged and anemic liver, in some other fish showed congestion and hyperemia in the liver. Isolates (n=6) were obtained samples from kidney, liver and brain following incubation at 22°C for 24 h on Tryptic Soy Agar medium. The biochemical characteristics of all isolates were studied by conventional bacteriological tests and following API 20NE Strip tests (bioMe´rieux). The causative agent of disease was determined as A. Sobria. Antibiotic-resistance of isolates was assessed by the Kirby-Bauer disk diffusion method for antimicrobial sensitivity of the isolate and evaluated according to NCCLS standards. The results showed that the strain was susceptible to chloramphenicol, florfenicol, flumequine, gentamicin, trimethoprim/sulphamethoxazole, erythromycin, kanamycin, tetracyclin, florfenicol, enrofloxacin, streptomycin, doxycline and nitrofurantoin; resistant to clindamycin, oxolinic acid, penicilin, nalidixic acid and vancomycin. This is the first case report that A. sobria as pathogenic agent of tail-rot disease in yellow tail cichlid.

Keywords: Pseudotropheus Acei, Aeromonas Sobria, Phenotypic Characteristics, Tail-Rot Disease

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FIRST REPORT OF CANDIDA SP. FROM RAINBOW TROUT (ONCORHYNCHUS MYKISS, WALBAUM) FRY IN TURKEY

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Abstract:

In this study, we isolated Candida sp. for the first time from rainbow trout fry in Turkey. The disease was observed in rainbow trout (avarage 0.2 g) at a water temperature of 10°C during February 2016. White colour areas due to yeast accumulation on gills and fusion of secondary lamella were observed in diseased fish. Samples for microbiological examinations were collected from the kidney, spleen and gills by using sterile swabs. These samples were streaked onto trypticase soy agar (TSA) and tryptone yeast extract salts (TYES) agar plates and incubated at 22°C in TSA and 18°C in TYES agar for 48 h.

Thirteen isolates were obtained from diseased fish. Gram staining was performed of isolates and all of these isolates were observed as yeast based on cellular morphology by using light microscopy. The identification was performed by ITS (Internal transcribed spacer) region sequence analysis and sequence data demonstrated that representative isolate D11 belonged to genus Candida. Yeast infection is thought to be caused by the use of heavy antibiotics in early developmental stages (larvae and fry) of rainbow trout (Oncorhynchus mykiss) for Rainbow Trout Fry Syndrome.

Keywords: Candida Sp., Rainbow Trout, Oncorhynchus Mykiss, Identification, Sequence Analysis

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SELECTION OF DENIM FABRICS FOR AS A WORK CLOTHING USING MULTI-CRITERIA DECISION MAKING

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Abstract:

Today, the success of a work highly depends on the worker satisfaction and the required cognitive efforts from the worker. The work efficiency of a worker increases when s/he feels comfortable against the effort required in working conditions. The usage of denim fabric provides comfort and durability in work clothes; therefore, it is preferred from all age groups and gender groups in the industrial apparel sector.

Multi-Criteria Decision Making (MCDM) is the fastest-growing tool in operations research that deals with selection problems under the presence of multiple and conflict criteria and alternatives. MCDM has different approaches and methods that distinguish themselves in terms of procedures, theoretical assumptions, and the type of decision addressed.

The VlseKriterijuska Optimizacija I Komoromisno Resenje (VIKOR) is one of the most popular MCDM technique. The VIKOR method is a well-known and effective decision making method that is able to achieve a compromise solution for complex decision problems. This method can help the decision makers to reach a final decision of ranking and selecting. It has been widely utilized in different fields to obtain compromise ranking in the problems.

This study presents a MCDM approach to select the denim fabrics as a work clothing. A denim fabric is intended to be used as a work clothing material should have four decision criteria of fabric quality parameters as weight, stiffness, tear strength and tensile strength. The selecting and ranking the best alternative for a particular end-use requirement is a complex task, as multiple decision criteria have to be considered simultaneously. The VIKOR method has been used for ranking 18 denim fabrics in terms of their overall quality value considering their applicability as a worker clothing.

Keywords: Multi-Criteria Decision Making, Vikor Method, Denim

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PRODUCT DESIGN IMPROVEMENT WITH TAGUCHI METHOD

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Abstract:

Customer satisfaction has become an important factor for competitiveness in today's global market. To produce a high quality product is very important in customer satisfaction. It ensures to gain customer confidence and profitability of companies. Not being able to provide a high quality product to customers will ultimately lead to a decline in profits for manufacturing companies. Therefore, the approaches that design high quality products during product development is extremely crucial in survival of companies in increased competition generated by not only domesticly but also internationally.

The Taguchi method has attracted great interest in recent years. This method was firstly developed by Genichi Taguchi and is widely accepted as a simple and effective solution for parameter design and experimental planning to improve product quality. The Taguchi method is a variance reduction technique which can improve quality of a high quality products at minimum cost. The design of a high-quality products at low cost with high performance is identical to the design of products, processes or manufacturing systems.

In this study, it is aimed to improve the quality of the glass. Firstly the factors that are important in quality of a glass and their levels are determined. Then, these factors and their interactions are analyzed using the Taguchi method for glass. Finally the optimal levels of the factors are determined using the Taguchi method.

Keywords: Taguchi Method, Product Design, Product Quality, Customer Satisfaction

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A QUANTITATIVE APPROACH FOR DEPTH ESTIMATION FROM SELF-POTENTIAL ANOMALIES CAUSED BY BURIED HORIZONTAL CYLINDER SHAPED BODIES

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Abstract:

The self-potential (SP) method based on the measurement of naturally occurring potential differences generated mainly by electrochemical, electrokinetic, and thermoelectric sources has a wide range of applications in engineering and geotechnical investigations. Simple geometrical-shaped models can be useful in quantitative interpretation of SP data. In this study, a quantitative interpretation of SP anomalies due to horizontal cylinder shaped bodies is presented. The approach is based on inverting the observed self-potential anomaly by means of eqiuvalent sources located at a fixed depth under all observation points. We calculate their magnitude of polarization by a simple least-square method where the polarization angle is a pre-assumed initial value constant for all the equivalent sources. Thereafter we shift the level of the fixed depth of the equivalent sources to a new value and retrieve the anomaly response which is acceptable to be the upward continuation of the observed anomaly proportional to the shifting quantity. Then the depth to the source is estimated using the ratio of the observed and retrieved anomalies at the horizontal source location. The location as well as the real polarization angle of the source is determined by an iterative modification of the initial polarization angle of the equivalent sources. The proposed approach is applied on various synthetic data produced by using different model parameters of the source depth, the polarization angle, and the horizontal location of the source. In all cases, the depth solutions obtained are in good agreement with the actual ones. The approach proposed in the present study may be useful tool for a rapid estimation of the depth of a burried horizonatal cylinder shaped body causing self-potential anomalies.

Keywords: Self-Potential Anomaly, Horizontal Cylinder, Depth Estimation, Equivalent Source

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THE CURRENT EARTHQUAKE ACTIVITY IN GOKOVA GULF AND ANALYSIS OF JULY 21TH, 2017 BODRUM EARTHQUAKE

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Abstract:

On the day of July 21th, 2017, at time of 01:31 in the Aegean Sea (Mugla-Bodrum District, Turkey), an earthquake with magnitude Mw=6.5 is occurred. After the main shock, 2914 aftershocks whose magnitude changes between 1.0 and 4.9 were recorded until August 1th, 2017. The magnitudes of 25 aftershocks are higher than 4.0. In this study, the regional and temporal variations of seismicity in and around the Gokova Gulf before and after the Bodrum Earthquake occurred at July 21th, 2017 are determined by using seismotectonic b-value, fractal dimension Dc-value and precursory seismic quiescence Z-valuefor a detailed analysis. The catalog includes 34134 earthquakes between 1970 and 2017with magnitudes between 1.0 and 6.0, and the catalogs declustered with Reasenberg algorithm for the analyses. b-value is estimated as 1.01±0.04 with a completeness magnitude Mc=2.6, and Dc-value is calculated as 1.84±0.05 in a scaling range between 5.11 and 67.30 km. This b-value is well represented by the Gutenberg-Richter law and this large Dc-value indicates that seismicity in the study region is more clustered at larger scales or in smaller areas. At the beginning of 2016, some seismic quiescence anomalies are observed in and around Gokova Gulf including Bodrum district. As a remarkable fact, the combination of these types of seismotectonic parameters may supply some significant evidences in the evaluation of the next earthquake potential in and around the Gokova Gulf and earthquake region, and these anomaly regions may be considered as the possible locations of the future earthquakes.

Keywords: Bodrum Earthquake, B-Value, Dc-Value, Z-Value, Gokova Gulf

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HARMONICS OF ANALYSIS TWO PHASE LOADED THREE PHASE TRANSFORMERS

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Abstract:

Unbalanced loads of transformers in electrical installations are common problems. As a result of the unbalanced load, the boiler walls of the oil transformers overheat. In this study, the equivalent circuit for each harmonic order is obtained by using the equivalent circuit of the transformer. One phase of a three-phase transformer is fully loaded, the other phase is half-loaded, and the third phase is not loaded.. In this case, the transformer effects of harmonics are examined. Three phase 4 kVA, 400/230 V, 50 Hz one phase full load of one transformer, one phase half load is loaded, no load is taken from the third phase. Experiments have shown that the 3rd, 5th and 7th harmonics are more pronounced, and that there is a significant difference between iron loss in R phase and iron loss in S phase. It has also been observed that the voltage remains within the standard limits of the total harmonic distortion.

Keywords: Harmonics, Transformer Losses , Equivalent Circuit

[*]*This study was supported by Necmettin Erbakan University Scientific Research Projects Office*

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SIMULTANEOUS FEATURE SELECTION AND ANN TRAINING FOR DATA MINING APPLICATIONS

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Abstract:

Feature selection is the method to find which features to be used for successful predictions. In a given datasetto be predicted there can be some inputs that are not important and do not affect the result much. These inputs can be eliminated for simpler and faster prediction. After elimination, the model gives very close results compared to the first model. It may even make the results better and more successful on some datasets. Feature selection has some advantages. Firstly it provides faster prediction model, improves the prediction success, and finally helps to understand relation of inputs and output easier. Artificial neural networks (ANNs) can be used for classification and they have very high accuracy rates. In the training process of ANNs, feature selection can provide advantages. For applying feature selection, it is necessary to decide which inputs to be eliminated. The elimination can be made by using a meta-heuristic algorithm. In this study, a new algorithm is proposed for simultaneously training ANNs and feature selection. For this purpose ant colony optimization (ACO) algorithm is used for feature selection and for each ant of the population at each iteration feed-forward ANNS are trained by using stochastic fractal search of the ACO algorithm. The obtained results of the proposed algorithm are compared with the full-input model on some well known classification benchmark problems and promising results are obtained.

Keywords: Feature Selection, Artificial Neural Network, Ant Colony Optimization, Stochastic Fractal Search

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SSIM: A HYBRID OF SOCIAL SPIDER AND IONS MOTION ALGORITHMS AND ITS APPLICATION TO ANN TRAINING

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Abstract:

Artificial neural networks (ANNs) are computational artificial intelligence techniques inspired from the biological nervous system. They mimic the human brain's abilities like thinking, inferring and making decisions. While doing so, they benefit from data, knowledge and experience, just like the human brain. ANNs are very successful in learning and predicting. They learn by training the examples and do predictions by using the learned knowledge. Therefore network's training/learning process is very important in ANNs and affects the success of the network. Many methods have been developed so far in the literature for training ANNS and among these methods meta-heuristic algorithms provide very successful results. In this study, social spider (SS) and ion motion (IM) algorithms are hybridized and used in the training of ANNs to take advantage of the strengths of the algorithms. SS algorithm is inspired from the behaviors of social spiders in nature and is a good candidate to find optimum points. IM algorithm is inspired from the motion of ions and avoids from trapping into local optima. In the study, the crystal phase of the IM algorithm is embedded to the SS algorithm in order to increase the search ability of SS algorithm and to avoid trapping into local optima. ANNs are trained by the hybrid SSIM algorithm on 3 classification benchmark problems and compared with IM and SS algorithms. The obtained results show that the hybrid SSIM algorithm has potential on training ANNs.

Keywords: Social Spider Algorithm, Ions Motion Algorithm, Artificial Neural Network, Classification

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FUZZY ROUGH ATTRIBUTE REDUCTION WITH APPLICATION TO CHURN PREDICTION IN TELECOMMUNICATION SECTOR

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Abstract:

The telecommunications sector has caused significant changes in lifestyle with developments in the internet and advanced communication products. From this point of view, telecommunication, which is one of the most important indicators of economic development, has become a strategic sector. Economies that can understand and analyze this sector will also have a say in the future economy. Because the telecommunications sector has a massive size data, it is difficult to train and evaluate predicting models. To be able to convert big data of telecommunication customers into useful information, the attribute reduction mechanism has been accompanied by classification procedures. Rough set approaches to extract redundant attributes from discrete data sets by preserving information content are widely used in the literature. Using the fuzzy rough set approach, it is possible to apply attribute reduction to the continuous data without applying the data discretizing operation, thereby avoiding the loss of information. For this reason, in this study, Fuzzy Rough attribute reduction approach is applied to telecommunication customer data for churn prediction and results obtained with this approach.

Keywords: Churn Prediction, Attribute Reduction, Fuzzy Rough Set

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GREY BASED UNMANNED AERIAL VEHICLE CHOICE

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Abstract:

Weapon system selection is a complex problem which contains too much variable and they interact each other according to time and conditions. Selected weapon systems form the national defense basis. Keeping up with technological developments make selection problem of weapon systems which has very high follow-on cost harder. Nowadays in the aviation sector, has big portion on world defense industry, unmanned aerial vehicles (UAVs) are getting more important day by day. In this study, selection of UAVs problem according to grey relational analysis method which is one of the methods of multicriteria decision making is tackled.UAVs cen bu used for civilian sector and military sector. Because of this fact criterias and alternatives can be various according to aims. In this study decision criterias are specified by unconfigured interviews which are made with experts of UAV area. Alternatives are selected among present UAVs by heuristic simulation method. Alternatives are evaluated according to criterias by grey relational analysis method and most suitable alternative selected.

Keywords: Multi-Criteria Decision Making, Grey Relational Analysis, Unmanned Aerial Vehicles, Weapon Systems

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SELECTION OF OPTIMAL FIDUCIAL POINT LOCATIONS ON FACES WITH GENETIC ALGORITHM FOR DOWN SYNDROME IDENTIFICATION SYSTEM

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Abstract:

Down syndrome is one of the most commonly encountered dysmorphic syndromes. There are some salient facial features in patients with Down syndrome and those features contain discriminative information. This information can be implemented to diagnose the syndrome in a computarized face-based diagnostic system. But it is a time consuming process to analyze whole face images in the computer environment. We chose to carry out the diagnosis of Down syndrome by finding the most valuable and informative fiducial points on face images instead of using whole face images. Thus, useful classification results were obtained to provide for a fast pre-diagnose. Genetic Algorithm (GA) which is a successful heuristic method was used to determine the optimal fiducial points. Feature extraction was performed with Gabor Wavelet Transform (GWT). Classification process is implemented with k-nearest neighbor (kNN) and support vector machines (SVM) methods. During SVM classification, the best results were attained with order of 3 in polynomial kernel and scaling factor of 1 in RBF. We used the cityblock and euclidean distances as a distance metric in kNN classifier. The results were given according to the 3NN. Considering the average of classification accuracy rates for the GA based approach, the best results achieved were 77,1% and 74% with SVM-rbf and SVM-poly classifiers, respectively. The lowest classification level was 46,25% which was obtained with kNN-euc classifier in lattice based sampling. SVM-rbf classifier type has showed better results than the others. Considering the average of classification accuracy rates, we obtained better results with SVM based classification methods than kNN based for both testing strategies.

Keywords: Down Syndrome, Gabor Wavelet Transform, Face Recognition, Genetic Algorithm.

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SIMULATED ANNEALING - BASED METAHEURISTIC APPROACH FOR PILOT TONES DESIGN IN OFDM-IDMA SYSTEM

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Abstract:

The possibility of increasing the channel estimation performance significantly by adjusting the pilot positions for the related channel has converted the pilot design process into an important optimization problem to be considered in wireless communication systems. Therefore, in this paper, Simulated Annealing (SA) algorithm, which has been utilized to solve countless problems in various engineering fields so far, is employed for the optimization process of the pilot positions and thus, the estimation performance of the Least Squares (LS) algorithm used for channel estimation in Orthogonal Frequency Division Multiplexing – Interleave Division Multiple Access (OFDM-IDMA) system is maximized. Furthermore, the complexity of Mean Square Error (MSE) that is used as the fitness function of SA is reduced by obtaining its upper bound with the help of Gershgorin disc theorem. By using the upper bound of MSE as the fitness function of SA instead of MSE itself, the matrix inversion process which is required in the calculation of MSE is eliminated. Herewith, the computational load per the iteration of SA algorithm is decreased. In the simulations, our proposed SA-based metaheuristic approach for pilot design problem in OFDM-IDMA system is compared to the random and equispaced – based pilot placement techniques that are known as classical methods. The performance comparison of the considered pilot design techniques is carried out with respect to the Bit Error Rate (BER) and MSE criteria. According to the simulation results, our proposed method shows clearly better performance compared to the classical methods with regard to both BER and MSE criteria.

Keywords: OFDM-IDMA, Pilot Tones Design, Simulated Annealing, Channel Estimation, LS Algorithm

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WEB BASED INTELLIGENT TUTORIAL SYSTEMS: BILZOS

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Abstract:

Any more, technology is used at all areas of life. The most important one of these areas is education. At education fields, Instead of classical web based systems, the use of intelligent tutorial systems is common. Intelligent Teaching Systems are education systems which aim at effective and quality education and which try to provide o good environtment between students and teachers and which include rich materials and are adapted to individual. It was started to be preferred the computer systems that determine what, to whom and how to teach and that use the techniques of artificial intelligence instead of classical web based systems. The most important one of these systems is web based adaptable Intelligent Tutorial System.

At this study, web based adaptable intelligent tutorial system was designed. The people can reach this system from everywhere because it is a web based system. In general, this software includes a lot of intelligence feature, which the contents are suitable for the students level, the student can pass the forward test according to the final test of unit, the student can see the true or false answer, the time of the students at the page is saved, the student is canalized the subject or the unit that he/she has some shortage, and the student can't pass the new unit without finishing the former subject or the unit. This web based intelligent tutorial system was designed, as it is used at the many lessons at the same time. Thanks to this feature, this platform easily can be applied at a lot of lessons. It was purposed that this system contributes to the development of the students at many lessons. The detailed and visual interface of this software was explained at the forward sections of this study.

Keywords: Intelligent Tutoring System, Web Based Learning System, Intelligent Tutoring Software,

[*]*This study is supported by Scientific Activities Support Program of Amasya University*

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USAGE OF DIFFERENT MACHINE LEARNING ALGORITHMS IN THE CLASSIFICATION OF EPILEPTIC SEIZURE BASED ON EEG SIGNALS WITHOUT FEATURE EXTRACTION

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Abstract:

Epileptic seizures occur as a result of sudden and unexpected electrical parasites of the brain. Electroencephalogram (EEG) is a valuable clinical tool used to evaluate human brain activity. Detection of epileptic seizures in EEG signals is an important part of the diagnosis of epilepsy. In this study, the epileptic seizure recognition data set from the UCI machine learning database was used. This data set contains 2300 epileptic seizures and 9200 non-epileptic EEG signals. Based on EEG data distribution, the epilepsy data set is an imbalanced dataset. The sampling frequency of the EEG signals is 173.61 Hz and the recording time is 23.6 seconds. In this study, no feature extraction algorithm was used to distinguish epilepsy from EEG signals. The raw signals are directly fed to the classification algorithm. Three different classification algorithms have been used to classify EEG signals as epilepsy and non-epilepsy. These classification algorithms are: k-NN (for k = 1), C4.5 decision tree and Naive Bayes. The classification performance values obtained with the 50-50% train-test holdout data partition method are 94.05%, 94.50% and 96.00%, with the 10-fold cross validation method are 95.05%, 94.72% and 95.75%, respectively. The obtained results show that epilepsy patients can be detected only by classification algorithms without extracting the feature from EEG signals.

Keywords: EEG Signals, Epileptic Seizures, Classification, Machine Learning Algorithms

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ECONOMIC ANALYSIS OF WIND-HYDRO PUMPED STORAGE POWER SYSTEM

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Abstract:

The use of renewable energy systems has grown continuously in recent decades and significantly in the world energy sector. Currently, the best-known renewable energy sources include solar, wind, ocean and geothermal energy. In addition, the hydroelectric power systems are important in energy conversion systems. The pumped hydro storage systems use excess electricity production, in periods of low demand, to pump water to a deposit situated at a certain height, recovering it at a later time through a turbine when it is required to cover peak load periods. Hybrid energy system has become viable alternatives to meet environmental protection requirement and electricity demands. In this paper, economic analysis of hybrid systems which are the Hydroelectric Pumped Storage System (PHES)-wind energy conversion system are presented. The hybrid system is proposed in Borcka dam, Artvin, Turkey. The detailed of project area and components of hybrid systems are determined for case study. Finally, economic analysis results for hybrid system are discussed in this paper.

Keywords: Hybrid Systems, Wind Energy, Hydroelectric Pumped Storage System,Economic Analysis

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EVALUATION OF SEISMIC REFRACTION DATA USING ARTIFICIAL BEE COLONY ALGORITHM

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Abstract:

In this study, the artificial bee colony (ABC) algorithm was used to evaluate the seismic refraction data. The main logic of the ABC algorithm is the swarm behavior modelling as it is in other meta-heuristic algorithms. This algorithm was developed by modeling the nutritional search behaviors of the bees. There are three possibilities in the food search. These are; sharing information with other bees, going back to the source of food and researching new food sources. The application style of the method in evaluating seismic refraction data is considered to be a bee colony of geophones. The arrival times recorded in the geophones represent the food exploration area of the bee colony. Finally, the underground model represents the area where the best food source is located. As a result, the time difference between the arrival time of the seismic wave observed in the geophones and the arrival time generated from the underground model is optimized to the minimum. Access to nutrient source of all swarm results in obtaining layer thicknesses and seismic velocity values. Finally, this method was applied in a case study at the east part of Izmir city in west of Turkey to describe subsurface properties. For this purpose, it is observed that it is compatible with the results obtained from traditional data evaluations. It has been concluded that the ABC algorithm can be a promising optimization approach in achieving layer thickness and seismic velocities using seismic refraction data because of the presence of successful estimates in all models.

Keywords: Seismic Refraction, ABC Algorithm

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EARTHQUAKE SIMULATION BY USING SYNTHETIC SEISMOGRAMS AND MASW DATA

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Abstract:

Earthquakes are one of the most devastating natural disasters. The earthquake resistant building design allows us to avoid this destructive effects. These designs can be made possible by estimating the effects of earthquake for the structure area. The most important parameter in this subject is the peak ground acceleration (PGA) value. The accuracy of the predicted PGA value is directly proportional to the realism of the durable structure design. The most important factor in this preliminary estimation is the determination of the soil properties. Although the soil properties are explained by many parameters, one of the most important ones is Vs30. Within the scope of this study, MASW studies were performed for the 3 selected points in Balcova/Izmir, and Vs30 value was obtained. One of these points is the BLC strong motion station. Then synthetic seismograms were created by selecting the relevant parameters (Mw, x, tectonic regime) for the selected earthquake (12/06/17 12:28 GMT Mw=6.2 Mytilene Earthquake) for these 3 points. PGA values which obtained from the real and synthetic accelogram was compared for BLC station. In conclusion, there is a great harmony between these two PGA values.

Keywords: Simulating Earthquakes, Soil Conditions, Masw, Vs30.

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RISK ASSESSMENT OF EMPTY PESTICIDES CONTAINERS AND MODEL SUGGESTION FOR REDUCING THE NEGATIVE EFFECTS

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Abstract:

Considering the diversity of applications of agricultural activities, it is apparent that it is impossible to prevent spreading hazardous waste such as pesticide packages and recollecting them. Hence, it is necessary to collect the empty pesticide packages in a neat and functional way, and to deliver them to the disposal facilities. In this study constructed to improve an ecological, economical, and a sustainable collecting & disposal model in order to determine and decrease the risks, interviews were conducted and the prepared surveys were carried out the with farmers in selected five pilot villages having different crops. According to the obtained results, the most important risks of empty pesticide packages are as follows: overuse of pesticides; farmers that have no knowledge about using agricultural pesticides and disposing their packages (78%); used agricultural pesticide packages left (17%) close to fields and gardens, littered to general dumpsters (53%) or burnt (12%); reuse of especially metal and plastic pesticide packages for different purposes; not knowing the cleaning methods of empty pesticide packages, and not having a collecting unit for empty pesticide packages. To decrease these risks to a minimum amount, empty pesticide package collecting units were built to the villages selected for temporarily storing these packages before they were sent to the disposal facilities. As a result of six months of monitoring, in collecting units, it was obtained that the 76 percent of the used pesticide packages (type of packages: 49% plastic, 47% paper, 3% metal) were collected, and the waste amount except the pesticide packages was less than 1%. These results prove that it is highly possible to use this built system in an effective way. Moreover, assessing the results altogether, the activity of the model is likely to increase with establishing a work and an information network between the farmers, the enterprises selling these pesticides, the associated public institutions and the nongovernmental organizations.

Keywords: Risk Assessment, Empty Pesticides Containers, Model Suggestion, Negative Effect Of Pesticides Containers

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EFFECT OF AEROBIC COMPOSTING OF SEWAGE SLUDGE ON VIABILITY OF WEED SEEDS

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Abstract:

Municipal wastewater treatment sludges contain organic matter, nitrogen, phosphorus and micro-plant nutrients at high levels. That is why soil has an important potential as a healing and fertilizer provider. However, weed seeds in sewage sludge limit their function. In this study under the scope of investigating the effects of aerobic composting application on the viability of foreign weed seeds in sludges, certain amount of tomato seeds were added to municipal sewage sludge and were composted aerobically for 30 days in composters with a capacity of 60L. When tomato seed was selected, it was considered that the seeds of this plant are highly resistant. Temperature, pH and CO2 parameters were continuously monitored throughout the composting period. After the composting, the samples taken from the homogenously mixed compost were placed in 2 L containers with a depth of 10 cm. Composted and noncompounded sludges were used without adding seeds for control purposes. The containers were irrigated regularly for 20 days. During the study, there was no germination of tomato seeds in composted and uncomposted sludge (control applications) without seeds. In the uncomposted sludge application, different plant germinations were observed. Composted samples containing tomato seeds demonstrated that 21% of the seeds that were initially used, were germinated. This is thought to be due to significant changes in pH (6,71-7,48) and temperature (28-54 oC) during the composting period. The results of the study demonstrate that aerobic composting of domestic wastewater sludge is of considerable efficiency in the removal of weed seeds and that composting sludge will be of great benefit in soil rehabilitation and crop production. It is also believed that the removal of tomato seeds, which are highly resistant, is an important indicator for the removal of other weed seeds.

Keywords: Sewage Sludge, Composting, Weed Seed, Improve Soil, Plant Nutrient

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INVESTIGATION OF DIFFERENT FIELD ORF VIRUS STRAINS BY RESTRICTION ENDONUCLEASE MAPPING

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Abstract:

Orf virus; located in the Parapoxvirus genus of Chordopoxvirinae subfamily, belongs to Poxviridae family. The agent is a viral skin disease that causes economic damage due to infectious pustular dermatitis and death in affected young small ruminants. Additionally, the disease has importance to human health due to zoonotic potential.

Because the orf virus is double-stranded DNA, it is highly resistant to mutations and environmental conditions. PCR based diagnostic methods are frequently used for identifying orf virus infection. And sequence analysis is an essential method for understanding the genetic diversity of field isolates because the molecular characterization of field strains is crucial to vaccine use struggle programs. Besides that, before sequence analysis, RFLP method can be used for confirmation to pre-validate the PCR product.

We aim to verify the restriction endonuclease regions of field isolates which sequence data obtained and demonstrate the regions that are detected in-silico by restriction endonuclease cleaving enzymes in practice. The results confirm the restriction endonuclease map of the local field strains, which differs in-silico from other nearby orf virus strains. Further studies are necessary to carry out effective control programs of orf virus infection by using the different vaccine and field strains causes epidemics.

Keywords: ORFV, Restriction Endonuclease, Small Ruminant

[*]All authors have equally contributed.

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TREATMENT OF DOMESTIC WASTEWATER BY DYNAMIC MEMBRANE BIOREACTORS

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Abstract:

The dynamic membrane consists of a cake layer (microbial cells, flocs, inorganic and particulate organic matter) formed during the filtration of wastewater through a large pore size (20 – 200 µm) support material (membrane, fabric or other textile products). Since the pore diameter is too large for microbial filtration, the filtration process provides low initial effluent quality at the beginning, however the cake layer formed over time can act as a conventional membrane and can provide efficient filtration. While dynamic membrane bioreactors provide much more economical filtration because the support materials usually cheaper than conventional membranes, chemical washing and high pressure costs on conventional membranes are also eliminated. In this study, two different textile materials (pore diameters 140 and 200 µm- and active filtration area of 0.01 m2) were tested for their possible dynamic membrane forming properties. For this purpose, 15 L aerobic reactors were operated in parallel. During the start-up period (100 days), MLVSS was reached to 8000 mg/L; sludge age was 10 days and HRT was 1 day. During the 166 days operation, stimulated wastewater contained 500 mg/L COD and removal rates were 439 and 435 mg/(L.day) for 140 and 200 µm reactors, respectively (87% COD removal for both reactors). The influent was contained 50 mg/L NH4+-N and nitrification rates for 140 and 200 µm reactors were 78% and 74%, respectively. As nitrification rate was increased, alkalinity decrease was observed and effluent alkalinity concentrations were 45±8.4 and 44±11 mg CaCO3/L for 140 and 200 µm reactors. Results show that efficient filtration of wastewater is possible with 140 and 200 µm dynamic membrane bioreactors at high MLVSS concentrations (8000 mg/L).

Keywords: Dynamic Membrane, Wastewater Treatment, Filtration, Organic Load

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REDUCTION OF REMAZOL BRILLANT VIOLET 52 IN UP-FLOW ANAEROBIC SULFATE REDUCING BIOREACTORS

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Abstract:

The textile industry is one of the largest water and chemical consumers and its wastewater is characterized by biochemical oxygen demand, chemical oxygen demand, suspended solids, and dissolved solids. The wastewater is typically contains 80-6000 mg/L BOD; 150-12000 mg/L COD; 15-8000 mg/L total suspended solids; 2900-3100 mg/L total dissolved solids; 1000-1600 mg/L chloride; 70-80 mg/L TKN and 50-2500 Pt-Co color. The presence of dyes in textile industry wastewaters may be toxic, mutagenic and carcinogenic. They may also resist light and heat, thereby reducing photosynthetic activity and negatively impacting the receiving environment. Among many decolorization methods, biological methods are preferred because they are cheaper and environmentally friendly. It is easier to remove the dyes from the water under anaerobic conditions, while azo dyes are not efficient in the biological degradation under aerobic conditions. In this study, two sulphidogenic anaerobic upflow reactors were operated for COD oxidation, SO42- reduction and dye removal. Reactors containing 500 mL and 1300 mL active and total volumes were utilized and influent sulfate concentrations were 2000 mg/L for both reactors. During the first 70 days of the study, the COD/Sulfate ratio was 0.67, which increased to 0.87 between days 70-192. Dye (Remazol Brilliant Violet 52) was added to feed at a concentration of 50 mg/L and then it was increased to 1000 mg/L gradually. While the reactors were fed with only sulfate reducing conditions, the maximum sulfate removal rate was 1285 and 1085 mg/(L.day). When the RBV52 was added to feeds of reactors, sulfate reduction rates were 1536 and 693 mg/(L.day) for ethanol and acetate fed reactors, respectively. The COD oxidation rate during RBV52 reduction were 1114 and 900 mg / L for acetate and ethanol fed reactors. In the last period when the maximum RBV52 was added, the influent RBV52 concentration was 1000 and the effluents were 0,85±0.15 and 2.54±0.1 mg/L for the ethanol and acetate reactors, respectively. The results demonstrate that over 99% removal of RBV52 dye in anaerobic upflow sulphidogenic reactors is possible.

Keywords: Dye Reduction, Sulfate Reduction, Up Flow Reactors, Textile Effluents

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MEASUREMENT OF ORANGE SIZE AND VOLUME USING MICROSOFT KINECT CAMERA

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Abstract:

In recent years, automatic vision based technology for the measurement of object sizes and volumes has become more potent and more important to many areas including agricultural fields, food industry, transportation, production, and forestry. This article presents an approach to orange size and volume measurement using Microsoft Kinect Camera. Although Microsoft Kinect Camera was developed to gather distance images for gaming environments, it can be used for real-time environmental scanning, segmentation, classifications and scene understanding. Kinect contains not only an RGB camera, but also a depth sensor based on infrared triangulation measurements to measure distance between sensor and objects. The Kinect sensor runs a series of algorithms on the captured data to give you more than an image, which tells you how far each pixel in that frame is. The depth pixel contains the distance between the Kinect device and the objects in front of the device, in millimeters. The data are represented based on the X and Y coordinates in the depth sensor view. Our approach is based on measuring distance between sensor and all image pixels from a captured depth image. In this study, the image capturing chamber which was a wooden box was designed to capture orange depth image. A Kinect camera was mounted on the top center of the image capturing chamber. And also, image processing program was designed to collect x and y coordinates and the depth value (z) of each pixel on captured orange depth image. Finally, size and volume of the orange were calculated from the depth values. This study offers suggestions evaluating the Kinect depth images to determine objects posture as digitally.

Keywords: Kinect Camera, Volume Measurement, Depth Image

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USABILITY OF KINECT CAMERA ON OUTDOOR CONDITIONS FOR AGRICULTURAL MOBILE ROBOTS

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Abstract:

Agricultural robotics is a rapidly developing field of study and it has revolutionized many aspects of agricultural applications. In many applications, robots need to navigate through unknown environments to achieve their goals. For this reason, mobile robots require a lot of data for which to localize and navigate themselves to entering the environment. State of the art agricultural robot navigation systems uses expensive sensor systems such as laser range finders and GPS receivers for accurate perception of the environment. Nowadays, researchers are looking for cheaper solutions instead of using expensive systems for agricultural mobile robots. At this point, Microsoft Kinect, originally developed for the Xbox 360 video game console, has literally invaded the electronics market and now reaching into robotics. Combining the imaging system of the Microsoft Kinect with the sensing techniques of the human eye has led to a low-cost, high-quality 3D camera that could be used in agricultural mobile robots. Both indoor and outdoor conditions, the depth camera of Kinect can also be used to navigate environments where robots can't take advantage of GPS. This is invaluable for use in obstacle avoidance and navigation for agricultural mobile robots. This article offers an overview of a set of experiments realized in literature with a Microsoft Kinect Camera, in order to assess its potential for navigation applications of agricultural mobile robot.

Keywords: Kinect Camera, Mobile Robot, Image Processing, Agricultural Mechanization

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COTTON FABRICS OBTAINED UV PROTECTION PROPERTIES WITH ZINC-CHITOSAN BIO-NANOCOMPOSITES

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Abstract:

Cotton fibers are used in many applications due to its superior properties. With the improvement of natural fiber based bio composites, the requirements are increased[1]. The usage of cellulose-based materials in composites has increased over the last few years because of their relative cheapness compared to conventional materials, their recyclability, and their mechanical properties[2]. With the advancement of nanotechnology, nanomaterials, metal oxide nanoparticles(NPs) have been spplied in cellulose based biocomposites [3].Due to of its high UV blocking and antibacterial properties, zinc oxide(ZnO) ultrafine particles are being widely used in functional textile applications [4].These kind of materials can be applied onto the cotton fabrics by different and ecological ways such as plasma technology. Plasma treatment is an environmental friendly technique and an effective way of improving surface adhesion without affecting their bulk properties. It was reported that plasma treatment could enhance loading efficiency of particles on substrate due to the effect of physical etching and chemical modification[5-6]. Zinc oxide nanoparticles(ZnONp) have been widely used in many fields such as textile, medical, electronic, cosmetic and food during the past few decades because of their unique biological, optical, electrical and catalytic properties. The UV protection and antibacterial properties of ZnONp make them a good candidate for textile industry applications. Studies have shown that the application of ZnONp to the fabrics in the form of polymer/ZnO composite material improves the UV protection and antibacterial performance. In this study, chitosan/ZnONp composite materials have been performed in terms of UV protecting ability. ZnONp have been synthesized by the precipitation of Zn(NO3)2. 6H2O with NaOH. The effects of different amounts of chitosan and ZnONp on the UV protecting propertis of the fabrics have been studied. For cotton fabric as the amount of ZnO in the nanocomposite increases, the UV protection properties increases. The structural features of nano-composites were investigated by using X-ray Diffraction(XRD), Data Element Type(DET), UV visible etc. analytical techniques.

Keywords: UV Protection,Nanocomposite,Cotton,Textile

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THE EFFECT OF DIFFERENT TYPES AND AMOUNTS OF FIBERS ON STRENGTH PROPERTIES OF CLAY

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Abstract:

The use of additives to improve the strength properties of soils has been become widespread gradually. Although there are many studies in the literature on materials such as cement and lime as an additive material for soil improvement, there are limited number of studies on fibers as an additive material. In this research, fibers were selected as additive materials and three different fibers (Carbon Fiber, Fiber Glass, Polyvinly Alcohol) have been used for improvement of soil. The strength properties of clay-fiber composites were conducted by a series of Unconfined Compression Test and Three Axial Compression Test. For prepare the samples, both standard and modified proctor test were used as compaction method. In the experiments, these three fibers were prepared at four different percentages of fiber content (0.1%, 0.2%, 0.3% and 0.4% by weight of soil) at optimum moisture content. In addition to fibers, silica fume was used to increase cohesiveness between soil and fibers. The results show that unconfined compressive strength and shear strength of clay samples increase with inclusion of fiber additives alone or in combination with silica fume. The highest values of UCS and Shear Strength was obtained from 0.2% Carbon Fiber-reinforced clay, %0.3 Fiber Glass-reinforced clay and %0.2 Polyvinly Alcohol reinforced clay.

Keywords: Fiber, Clay, Silica Fume, Soil Improvement, Shear Strength

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ALTERNATIVE NATURAL FORMALDEHYDE SCAVENGER FOR LEATHER INDUSTRY: COLLOIDAL AMINO ACID FILLER IN RETANNING PROCESS

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Abstract:

The increasing concern about the potential health problems of toxic chemicals in leather products forces many companies while producing or importing the leather articles because of the stringent stipulations. The most important technical issue concerning ecology and consumer health is the formation of free formaldehyde in the final products. In this study, colloidal amino acid filler (CAAF) was obtained from low grade by-product of gelatin manufacturing process of bovine shaving wastes with the hydrolysis reaction. 1%, 3% and 5% CAAF (concentration: 40%) was used in retanning process of phosphonium tanned leather to examine how formaldehyde content changed in the final products by comparing with the control leather samples. According to the analyses, 82.4 ppm formaldehyde content of phosphonium tanned leather as control group was reduced to 63.8 ppm with 1% CAAF, to 42.8 ppm with 3% CAAF and to 40.1 ppm with 5% CAAF. As a result, CAAF obtained from leather shavings to be used as natural formaldehyde scavenger has a good potential in achieving the benign treatment and reuse of the solid leather wastes.

Keywords: Leather, Collagen, Amino Acid, Formaldehyde, Scavenger, Shaving Wastes.

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TOWARDS SUSTAINABLE LEATHER AND TEXTILE PRODUCTION: GLANCE INTO THE DYEING WITH NATURAL MATERIALS

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Abstract:

The concept of environmental awareness and sustainable production has recently a major impact on the textile and leather industry and on the fashion world as well. Increasing concern about the potential health hazards of toxic chemicals forces many countries during producing or importing durations of the consumer articles. Coordinated efforts by the various organizations, the companies and the scientists are carried out to enable the development and implementation of strategies for sustainable recovery, usage, and recycling of the natural resources. Leather and textile industries are forced to adopt green/clean manufacturing options due to consumer awareness and statutory environmental stipulation norms in the last years. Sustainability of the industries can be achieved by adopting cleaner production techniques by effective utilization of chemicals or using and improving the performance of auxiliaries particularly natural dyestuffs in dyeing process. This study focuses on the possible natural dyeing approaches, challenges and critical factors for usage of alternate sustainable dyestuffs in leather and textile industry.

Keywords: Sustainability, Environment, Leather, Textile, Dyestuff, Natural Dyeing.

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ACCURACY ANALYSIS OF MATRAKCI NASUH'S KUTAHYA MINIATURE

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Abstract:

The Ottoman Empire survived for about 600 years. At the end of the 16th century, the Ottoman Empire ruled an area of approximately 20 million km2 extending from the Caspian Sea in the east to the Atlantic Ocean in the west. The Ottoman Empire, which had a very large landscape, needed products as a guide to determine its existing borders and to learn new places. Even during the Ottoman history, it is possible to encounter many products bearing map quality. Maps produced especially in the 16th century had an important place in Ottoman cartography. In particular, the world map designed by Piri Reis is valuable in terms of quality even today. Although both lived in the same period, researchers had more interest to piri reis' maps than Matrakci Nasuh's miniatures. However, while the maps of Piri Reis in terms of marine cartography is crucial, Matrakci's miniatures are valuable in terms of landscape cartography. Over 100 miniatures designed by Matrakci during the Suleiman The Magnificent's east and west expeditions should be evaluated in terms of city planning and cartography. The aim of this study is to examine Matrakci's Kutahya miniature in terms of cartography and to detect its importance as a map and city plan by determining the geometric and topological accuracy. In this context, landmarks such as mosque, mountain, bath etc. in the miniature were compared with maps and Google Earth images obtained by today's technology. In addition, the miniature was evaluated with the MapAnalyst software used to determine the geometric accuracy of historical maps and examined in terms of geometric and topological accuracy. Results indicated that although geometrical accuracy of the miniature was poor, topological accuracy was good.

Keywords: Historical Map; Matrakci Nasuh; Geometric Accuracy; Topologic Accuracy

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PHYTOCHEMICAL ENRICHED FUNCTIONAL BREAD: ANTIOXIDANT PROPERTIES

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Abstract:

The demand for consumption of healthy food products has been increasing thought the world. Therefore, there is a great tendency by the scientists and industry to develop functional food products providing not only nutrients but also health improving benefits.1 Research efforts on the incorporation bioactive compounds as value-added ingredients into various food products has steadily been intensifying. Phytochemicals are the bioactive compound of plants having many biological properties such as antioxidant, anti-inflammatory, antidiabetic, anticancer and others. As bread is one of the most widely consumed food product, it has been considered as a suitable food product for delivery of bioactive compounds. Therefore, enrichment of wheat bread with phenolic-rich phytochemicals is an effective technique to improve the antioxidant potential of the bread. Pseudocereals (buckwheat, quinoa, amaranth), pigmented and germinated cereal grains, legumes, spices, herbs, extracts etc. are among the naturally phytochemical rich materials that might be incorporated in the formulation for production of functional bread with enhanced bioactive features. In this review phytochemicals that contribute to the antioxidant properties of bread, are reviewed.

Keywords: Phytochemical, Bread, Functional Food, Antioxidant

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RADIOLOGICAL ASSESSMENT IN DIFFERENT SIZE MEDITERRANEAN MUSSELS (MYTILUS GALLOPROVINCIALIS) IN THE EASTERN BLACK SEA REGION OF TURKEY

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Abstract:

Natural (40K) and artificial (137Cs) radioactivity levels in soft tissue of Mediterranean mussels (Mytilus galloprovincialis) in three different sizes were determined. Samples have been collected from a total of twelve different stations of Giresun, Trabzon, Rize and Artvin province, the Eastern Black Sea Region of Turkey. The analysis was carried out to determine 40K and 137Cs radioisothopes using a coaxial HPGe detector of 55% relative efficiency and a resolution of 1.9 keV at the 1332 keV gamma of 60Co (Ortec, GEM55P4-95 model). The activity concentrations obtained for 40K and 137Cs are given in the unit of Bq/kg. The activity concentration range of 40K and 137Cs varied from 251.9±13.5 to 382.2±22.3 and from 0.68±0.03 to 3.16±0.13, respectively. Additionally, radiological impact parameters such as daily intake of 40K and 137Cs, annual committed effective dose and carcinogenic risk due to the consumption of mussel were calculated and compared with the international data. Although there were statistically differences ($p<0.05$) among mussel sizes according to 137Cs activity concentrations in soft tissue of Mediterranean mussel samples, it wasn't observed difference according to 40K activity concentrations ($p>0.05$). According to calculations, the average activity concentrations haven't shown any risk in terms of public health.

Keywords: Mussel, Black Sea, 137cs, 40k, Radiological Parameters

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DISTRIBUTION OF 137CS IN SEA SNAIL (RAPANA VENOSA) IN THE EASTERN BLACK SEA REGION OF TURKEY

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Abstract:

This study presents the results of 137Cs radionuclide concentrations in Sea Snail (Rapana venosa) samples in three different sizes collected from ten different stations of Giresun, Trabzon and Rize province within the border of the eastern Black Sea region of Turkey. The analysis was carried out to determine 137Cs radioisothope using a coaxial HPGe detector of 55% relative efficiency and a resolution of 1.9 keV at the 1332 keV gamma of 60Co (Ortec, GEM55P4-95 model). The activity concentrations obtained for 137Cs are given in the unit of Bq/kg. The activity concentration range of 137Cs varied from 0.31±0.01 to 1.79±0.08. Additionally, radiological impact parameters such as daily intake of 137Cs, annual committed effective dose and carcinogenic risk due to the consumption of mollusc (sea snail) were calculated and compared with the international data. There is no statistically difference ($p>0.05$) among sea snail sizes according to 137Cs activity concentrations in soft tissue of sea snail samples. According to calculations, the average activity concentrations haven't shown any risk in terms of public health.

Keywords: Sea Snail, Black Sea, 137cs, Radiological Parameters

[*]*This work was supported by the Scientific and Technical Research Council of Turkey (TUBITAK) under Grant No. CAYDAG-117Y210.*

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ANALYSIS OF POLYCYCLIC AROMATIC HYDROCARBONS (PAHS) IN TURKISH YOGURTS

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Abstract:

Polycyclic aromatic hydrocarbons (PAHs) are a group of nonpolar organic molecules containing two or more benzene rings. PAHs are released as a result of pyrolysis (burning) or incomplete combustion such as food, fuel or waste, and also other human activities. They generally occur as complex mixtures in our food and environment. Several PAHs have been demonstrated to be toxic, carcinogenic, or mutagenic. The primary source of humans to PAH exposure mostly by intake of food such as oils, cereals, vegetables and also milk and milk product. Therefore, it is very important to determine the level of contamination of milk and milk products.

In this study, the concentrations and distributions of 4 EU marker polycyclic aromatic hydrocarbons (PAHs; benz[a]anthracene, chrysene, benzo[b]fluoranthene and benzo[a]pyrene) were determined in 17 kinds of commercial yogurt specimens that manufactured by small- and large-scale dairy firms in Turkey. In total, seventeen yogurt samples that whole (3.5% fat), semi-skimmed (0.8 or 1.4 % fat) and skimmed (0.1% fat) which are widely consumed, were purchased from local Turkish supermarkets.

The method applied is liquid–liquid extraction of PAHs (saponification of yogurt samples with NaOH ethanolic solution), a pre-concentration and determination by reversed phase high-performance liquid chromatography (HPLC) equipped with fluorescence detection. The method was validated by determination of linearity, accuracy, precision, limit of detection (LOD), limit of quantitation (LOQ) and uncertainty with yogurt samples fortified at 0.25, 0.5 and 1 µg/kg concentration levels. The recovery of 4 EU marker PAHs ranged from 90% to 110% for yogurts samples with low (0.15%) and high (4.70%) fat content. The method is repeatable with relative standard deviation values <20% for all analytes.

Keywords: Polycyclic Aromatic Hydrocarbons, Yoghurt, Turkish Yogurts, Extraction Of Pahs, HPLC Analysis

[*]This study is supported by the Giresun University-Scientific Research Projects Unit [grant number FEN-BAP-A-14032016-68]

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THERMAL DEGRADATION KINETICS OF BLUEBERRY ANTHOCYANINS

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Abstract:

Food industry uses high amounts of food colorants. Since most of these additives are imported products, food industry devotes great budget to food additives every year. These components are not originally natural. Besides that they have recently been under question in terms of their potential side effects. Anthocyanins are an important alternative to these synthetic colorants. But their pH, heat and light stabilities limits their use in food processes. Up to 600 anthocyanins have been identified so far. Unfortunately, there is not enough information about their detailed stabilities. Blueberries are an important source of anthocyanins, which spread in the Eastern Black Sea region of Turkey. The objective of this study was to develop new experimental setup, that is cheap, fast and easily applicable for determining thermal stability of individual antocyanins by using mathematical models. Thermal degradations were modeled with first order reaction kinetic equations together with the Arrhenious equation. In this study, the thermal stability of blueberry anthocyanins was kinetically investigated at temperatures of 70, 80 and 90 ºC. Color intensity of the solution was measured instantaneously with this new experimental setup, which includes flow cell integrated UV-visible spectrophotometer. As a result, the developed method could be effectively used to predict the anthocyanin degradation during the thermal processing of the foods.

Keywords: Anthocyanin Stability, Food Colorants, Degradation Models, Activation Energy

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GEOSYNTHETIC MATERIAL APPLICATIONS USED IN MINING SECTOR - A CASE STUDY OF EMET BORON PLANT

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Abstract:

A large quantity of waste is produced as a result of mineral enrichment processes. Proper storage/disposal of plant wastes are high of importance in control of environmental problems occurring chemically and mineralogically due to heavy metal pollution and acid mine drainage (AMD). The resulting residue from mining activities should be stored in specific areas according to their properties. The structures used for this purpose are named as "Waste Dam", "Waste Storage Area" etc. Especially following the mineral preparation processes, the process of ensuring that contaminated waters coming from mine field and rain water leaking into the facility area and the solid and liquid (water, various heavy liquids, chemicals) isolation should be provided in order to prevent their effect to the environment. For the preparation of the waste dam base, the following considerations should be taken into consideration: a) preventing possible leakages to groundwater, b) reducing the pressure at the bottom of the dam and c) recycling of the wastewater. It is imperative that a fully secure core dam, which is impervious to all directions and free of leakage from slope, stream bed and body of dam, is required prior to the start of storage. Geosynthetic materials provide better containment performance than or equal to significantly thicker soil-only base or barrier layers. In this work, the application of geosynthetic took place in the Boron Plant of Emet, Turkey was addressed. In the construction of the impermeable layer formed at the bottom and side surfaces of the storage dams of the mineral wastes, the clay group with a minimum of 50 cm thickness and a maximum permeability of 10-9cm/sec, is laid with at least two layers and moistened under suitable conditions. These layers were reinforced with the use of high density polyethylene (HDPE) geomembrane with a minimum thickness of 1.5 mm and a permeability of 10-10 cm/sec. A geosynthetic clay was also applied to protect the geomembrane. If it is technically difficult to reduce slope inclination due to topographical conditions on the side surfaces and if it is possible to provide stability in steep slopes, instead of clay, geosynthetic clay layer is applied together with high density polyethylene (HDPE) geomembrane. The membrane is protected with a gravel-paved filter cover of 20 cm thickness and a soil-rock filling material is placed on top of it. The elongation on the membrane are determined according to DIN 16726.

Keywords: Mining, Waste Storage Dam, Geosynthetic Material, Geomembrane

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ROCK BIT APPLICATION PARAMETERS IN GEOTHERMAL DRILLING WORKS AND COAST ANALYSIS

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Abstract:

One of the most important parameters to make the right choice in drilling works are rock bits. The most basic rule is to choose a drill suitable for the possible formation feature. Once the drill has been selected, the drill operating characteristics are also factors that directly affect the performance of the drill as well as the drill cost. In the drilling operation, if the first basic rule is to choose the appropriate drill, the secondary basis is the drill operation conditions; the appropriate weight (WOB-weight on bit), the appropriate spinning speed (RPM-revolution per minute) and the appropriate liquid or air to get the rock pieces out of borehole. In order to carry out the drilling process, it is essential to get the right weight on the drilling bit inside the borehole. This is achieved either by hydraulic pressure or casing pipes with certain weight. The pressure required in the geothermal drilling machines is mostly provided by the drill collar. In case of lower weight, desired breaking effect cannot be obtained, while with the case of overweight, the more wear is inevitable for the drill bits. Rotation speed is one of the parameters that directly affect drilling bit life and drilling speed. The speed of rotation according to rock drillability is recommended to be 30-40 rev/min for the rocks with low strength, 60-120 rev/min for the rocks with medium strength and 70-140 rev/min for the rocks with high strength. The rotation speed increases the drilling speed, but with it drill bit abrasion will be more. These parameters according to formation strength show variation such as high turn speed and low weight in soft formations and low turn speed and high weight in hard formations. Their performances differ in drilling bits with the same IADC (International Association of Drilling Contractors) code from different manufacturers. For this purpose, especially in this study, the selection of the rock bits used in the drilling works, the appropriate usage parameters, the performances of the different brand rock bits and the effects on the meter cost of drilling will be given in detail.

Keywords: Drilling Rock Bits, Selection Of Rock Bits, Parameters For Rock Bits' Application, Cost Analysis For Rock Bits, Geothermal Drill

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TRADITIONAL YOGURT IN TURKEY

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Abstract:

This study will provide information about traditional yoghurt produced using different production techniques in different regions of Turkey. Yogurt production in Turkey is extremely common in home conditions, it is not possible to reach a statistically yogurt consumption data. According to TUIK's data, yoghurt production is 1,170,000 tons and consumption per capita is 30 kg. Yoghurt, which has an important place in our culture, is presented to consumers by diluting and ayran, sometimes by making the water more concentrated. It is widely consumed with olive oil and bread at breakfast, as it is mixed with cereals and raw materials in the production of various sacks and tarhana. To make the yogurt resistant to deterioration, methods such as salting, cooking, removing water, and increasing the dry matter, heating and preventing air contact during storage have been used. One of the indispensable flavors of traditional Turkish and Anatolian nutrition cultures, strained yogurt is one of the oldest and most important items in Turkish culture. The main principle in the production of strained yogurt is to reduce the water content by removing the serum phase of the strained yogurt to increase the product resistance to deterioration.

"Silivri yogurt" has been produced in Trakya region since 1870's years. The various traditional yogurts; "Winter Yogurt" in the Mediterranean region (Hatay), "Kurut" is consumed with soup, ravioli and some regional foods in Central Anatolia (Sivas) and Eastern Anatolia (Bingol), in Denizli "Denizli's YanikYogurt" , in Burdur "Kokez Yogurt, "Tulum Yogurt" in Antalya, "Dorak Yogurt" in Kayseri and Nigde, "Kulek Yogurt" in Isparta and Trabzon.

Keywords: Yogurt, Traditional Yogurt, Longlife Yogurt,Turkey

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DETERMINATION OF THE MINERAL CONTENT IN BUTTER MILK

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Abstract:

Buttermilk was the liquid left behind after churning butter out of cultured cream. Butter milk which is released during the production of butter is given directly to the sewerage and is not assessed in any way. It can cause environmental pollution with the type and concentration of the nutrients it contains. In the production of 100 kg of butter, 166 kg of butter milk is obtained as a by-product and is given to the sewer without evaluation.

This study aims to determine the mineral content in butter milk, one of the main pollutants in the dairy industry. Calcium, potassium, phosphorus, sodium and magnesium quantities were determined by simultaneous inductively coupled plasma optical emission spectrometry (ICP-OES).

In Burdur province, butter milk samples were taken at intervals of 1 month from three dairy plants and stored in a cold chain (+ 4 °C) and brought to the laboratory.

In these samples, Ca was 8476,94±751,22 mg/L, Mg was 526,31±107,27 mg/L, K was 1920,2±507,90 mg/L, Na was 6095,39±237,60 mg/L, and P was 7170,50±256,80 mg/L.

The obtained butter milk is valuable in terms of mineral matter; therefore, it should be evaluated in terms of nutritional and economical losses by evaluating it as whey and not simply discarding it.

Keywords: Butter, Butter Milk, Mineral Content

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TRANSPARENT HEATER STUDY OF ITO AND AG/ITO THIN FILMS: ELECTRICAL TRANSPORT AND INFRARED THERMOGRAPHY CHARACTERIZATIONS

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Abstract:

Transparent conductive oxide (TCO) thin films are well known as special semiconductors. In this study, Indium Tin Oxide (InO3:Sn or ITO) was chosen because of its high conductivity, transmission in the visible range of electromagnetic spectrum, wide band gap (> 3.5 eV), high optical transmittance (80–95 %) in the range of 400 – 700 nm, and the low electrical resistivity (< 200 μΩ.cm) properties. These optical, electrical and structural properties are strongly dependent on deposition parameters by fabrication techniques. We focus on fabrication, characterization, optical and electrical properties of the thermally deposited ITO and Ag/ITO composite thin films on glass substrates. Furthermore, we investigate the surface temperature profile of these thin films with IR thermography technique in the presence of an external voltage. It is observed that the Ag/ITO bilayer thin films exhibit significantly lower transmittance in the whole visible range of electromagnetic spectrum when it is compared to the transmittance of bare ITO thin film (~95%), whereas the band gap energy of the films remains the same by the addition of silver metal layer. Infrared (IR) thermography measurement technique is used with relatively accurate and high spatial and temporal resolution for measuring the distribution of radiant thermal energy (heat) emitted from a target surface on the samples. The IR thermography measurements also show that in the case of high voltage application, the surface temperature of the ITO thin film decreases by the addition of silver layer, although it is not observed a dramatic change in low voltage cases.

Keywords: Indium Tin Oxide, Thin Films, Semiconductor, Electrical Characterization

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SOME NEW RESULTS ON SOFT NT4 SPACES

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Abstract:

Gocur and Kopuzlu [1] showed that if a soft topological space (X,τ,E) is a soft T_4 space, then (X,τ,E) may not be a soft T_2 space (also may not be a soft T_3 space) . In this case, they described a new soft separation axiom which is called soft n-T_4 space. Then they indicated that if a soft topological space (X,τ,E) is a soft n-T_4 space, then (X,τ,E) is a soft T_3 space. And then they showed that any soft n-T4 space ⇒ soft T3 space ⇒soft T2 space ⇒soft T1 space ⇒soft T0 space. But converse is not true.

In the present paper we showed that if a soft topological space (X,τ,E) is a soft n-T_4 space, then topological space (X,τe) is a T_4 space for all e∈E. Also we showed that if (X,τ,E) is a soft topological space over X and (F,E) is a soft closed set, then F(e) is closed set in (X,τe), for all e∈E. And then we indicated some basic new properties about soft n-T4 spaces.

[1]: O. Gocur, A. Kopuzlu, Some new properties on soft separation axioms, Ann. Fuzzy Math. Inform. 9(3) (2015) 421-429.

Keywords: Soft Set, Soft N-T_4 Space, T_4 Space, Soft Closed Set, Soft Topology, Soft Separation Axioms.

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INCUBATION AND EMBRYONIC MORTALITIES IN DIFFERENT POULTRY SPECIES

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Abstract:

In nature most of poultry species collect their eggs (a clutch of eggs) for a certain period and, then try to obtain chicks via instinctual phenomenon called broodiness. During the broodiness period the egg yield from a bird is not received and, the number of chicks obtained from eggs in natural incubation is very low. For these reasons the artificial incubation has been invented in 400 B.C. In primitive times, rules of artificial incubation and practices were important information that requires expertise and closely guarded secrets passed from generation to generation. The first modern incubator is made in the middle of the 19th century in USA, considered the ancestor of large-scale incubator used efficiently for eggs of chicken, turkey, duck, and other poultry species in today's our modern world. In conjunction with the poultry industry has turned into a giant industry, nowadays there are colossal hatcheries where thousands of eggs are incubated. In the incubator, the environmental conditions are very important listed as temperature, humidity, ventilation, turning eggs. The quantities of these conditions vary according to poultry species. Embryo mortalities may be due to the maternal effects or parental flock management, in most cases through faults of environmental conditions of the incubator. The objective of this study is to provide information about incubation and intend to demonstrate the hatching faults encountered in our past experiences.

Keywords: Incubation, Embryonic Development, Mortality, Poultry, Hatchery

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METABOLIC DISORDERS IN BROILER CHICKENS

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Abstract:

Broiler meat is one of the most important sources of animal protein that is needed for a healthy and balanced nutrition of the continuously increasing world population. According to FAO predictions, in 2025 the total meat volume will reach 357.5 million tons, while the poultry meat will reach the highest meat production with 131.3 million tons and 36.7% share. Broiler chickens used for commercial production have been genetically selected for rapid growth, well feed efficiency, and high carcass yield for many years. Improvements in the yield of broiler chickens have also caused some health problems. These anomalies are defined as metabolic disorders, emerged in skeletal, respiratory, circulatory, and digestive systems. The most important diseases caused by abnormal conditions that occur in these systems of broiler chickens are leg problems (valgus varus, tibial dyschondroplasia, avascular necrosis or osteonecrosis of the femur head, footpad dermatitis), ascites, sudden death syndrome, and fatty liver haemorrhagic syndrome, respectively. These disorders lead to significant yield losses every year in the world. These disorders cause production loss to a higher degree every year in the world. In this study, it is aimed to review the information about metabolic disorders in broiler chickens.

Keywords: Metabolic Disorders, Broiler, Leg Problems, Ascites, Sudden Death Syndrome

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INVESTIGATION OF THE EFFECT OF BLOWING AGENT AND SURFACTANT CONCENTRATION ON ISOCYANATE-BASED POLYIMIDE FOAMS.

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Abstract:

Polyimide foams are among the most important materials for high tech industries such as aerospace, aviation, military industries. However, polyimide materials are still unaffordable materials because of their complex synthesis process and expensive ingredients. Nevertheless, there are too many researches that aimed to make these foams cheaper. In this research, two important ingredients, water and surfactant, will be investigated. Polyimide foams were synthesized by using two solutions. While the first solution consists 3, 3', 4, 4' benzophenone tetracarboxylic acid dianhydrate (BTDA), and overdose polymethylene polyphenylene isocyanate (PAPI), the second solution contains dianhydride derivatives, water, catalysts and surfactant. The second solution was synthesized using 0 wt. %, 5 wt. %, 10 wt. %, 15 wt. % and 20 wt. % water and surfactant. Final foams were examined via several thermal, mechanical and morphological analysis methods. As a result of these analyses, important progress will be obtained for determination of optimal formula of isocyanate-based polyimide foams and these results will help to the commercialization of polyimide foam materials.

Keywords: Polyimide, Foam, Blowing Agent, Surfactant, Aerospace

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INVESTIGATION OF THE EFFECT OF GRAPHENE OXIDE CONCENTRATION ON ISOCYANATE-BASED POLYIMIDE FOAMS

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Abstract:

Polyimides are among the significant foam materials because of their thermal and thermo-oxidative stability, superior chemical resistance and excellent mechanical properties. There are two main methods to synthesize polyimide foams. Powder foaming method is a two-step process performed using diamines and dianhydrides and one-pot method is another synthesis method performed using dianhydrides and diisocyanates. The foams synthesized via powder foaming method exhibit better thermal properties but this method has some disadvantages such as complex process, non-commercial ingredient usage and high price. One-pot method is an easier method to synthesize polyimide foams but thermal properties of the final foams cannot be competitive. In this research, polyimide foams were synthesized via the second method by using pyromellitic dianhydride (PMDA) and polymethylene polyphenylene isocyanate (PAPI). For the purpose of enhancing thermal properties of final foams, graphene oxide was used with different weight concentrations, 0 wt. %, 0.25 wt. %, 0.50 wt. %, 0.75 wt. % and 1 wt. %. Final foams were examined via several thermal, mechanical and morphological analysis methods. The main goal of this research is to close the gap on thermal properties between powder foaming method and one-pot foaming method while maintaining the easiness of one-pot foaming process and to commercialize these foams.

Keywords: Polyimde, Foam, Graphene Oxide, Aerospace

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DESIGNING AND EVALUATING MAP SYMBOLS FOR ELEMENTARY SCHOOL STUDENTS

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Abstract:

Maps can be used effectively when designed with different features and needs of the users. Especially, maps used by students in basic education need to be carefully designed. In this context, cartographers have important duties and responsibilities in the designing maps suitable for cognitive development levels of children. For this purpose, for the first stage of training namely "Turkey Atlas for Elementary School" atlas design and production was carried out by the authors. Atlas prepared in accordance with the level of the elementary school students, contains different thematic maps about Turkey (Political, Physical, Regional, Tourism and Economy Maps etc). For torism and economy maps of Turkey, 66 symbols representing the most important values of our country, were designed. In this study, the identification of the symbols and the testing of the perceptibility of these symbols will be explained. The perceptibility of these symbols was tested with 100 elementary school students (9-10 age). Symbols with a perception rate of less than 50% were redesigned. In this context 18 symbols, redesigned and with new symbols atlas completed.

Keywords: Children Map, Map Design, Symbolization,

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PROTECTION AND IMPROVEMENT OF WILD SHEEPS WITH PHOTOGRAMMETRY TECHNIQUES

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Abstract:

Today, with the development of remote sensing and photogrammetry techniques of the rapid, precision and detailed maps produced, user needs and scope of map use have been increased. Documentation of archeology and cultural heritage, large-scale map making, agricultural activities and increasing agricultural productivity, disaster management and ecosystem analysis are some of these. In recent years, ecological systems that have arisen with the mutual relations of living things in a certain region and the inanimate environments that surround them, have also been explored by remote sensing techniques in recent years. Remote sensing (UAV, LIDAR, Satellite imaging), GNSS, Camera Traps techniques contribute to improvement, conservation and control of wild life and also support the detection of the old habitats of species that must be protected and biodiversity. Wildlife include various researches such as wild mammals, birds, reptiles, wild plants, forests and marine life. In this study, researches on conservation, development, control and tracking of wildlife using photogrammetry techniques in our country and other countries were examined and contribution of photogrammetry techniques to wildlife was researched. In this context a project is developed by the authors, to detect, classify and tracking wild sheeps in open spaces with UAV. Furthermore, this project is the first research will be done in the field of geomatics engineering inTurkey. In this paper, details of the techniques to be used within the scope of the project and the initial stages of the project will be shared.

Keywords: Photogrammetry Techniques, UAV, Wildlife Protection

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A SURVEY ON DIGITAL RIGHTS MANAGEMENT

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Abstract:

There are a lot of productions such as scientific, literary or artistic products in our daily life. The rights of real or legal persons producing these productions must be protected. The concept of the intellectual and industrial property rights has been put forward so that the creators of the idea have rights on their own production and these rights can be protected. In other words, intellectual and industrial property rights are on all kinds of intellectual property that arise in forms such as production, publications, trademarks, patents, industrial design, names or images and geographical indications that we encounter almost every field of our daily life.

With the progress of the technology and the increasing of the bandwidth, the number of mobile devices, service providers has increased. Mobile devices have become parts that are not separated from us. For these reasons, the contents have been converted to digital for adapting to mobile devices. These developments have made our life easier, however they have brought some problems. The content in the digital medium can be easily copied and distributed to everyone. The rights that the content owner has on digital content must also be protected. The digital rights management (DRM) can be defined as the protection, monitoring and restriction of the rights on digital content. DRM refers to access control technologies designed to prevent the copying / using of digital content in an unintended and uncontrolled manner, to protect copyright and to limit access to content.

In this paper, we present an overview of digital rights management. We look into the basic DRM architecture and the components of this architecture. We express the most important rights expression languages. Then, we explain the relationship between cryptography and DRM. Finally, we express the DRM technologies.

Keywords: Digital Rights Management, Cryptography, Access Control

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MOVIE RECOMMENDATION SYSTEM USING DISTRIBUTED MACHINE LEARNING

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Abstract:

The Recommendation system is a technique that make suggestions based on user's personal characteristics, regardless of the user. In these systems, people don't search available movie on the contrary systems present appropriate movie for them. It is found out movies that is not got by searching thanks to the recommendation system. In literature there are three methods. The first one called collaborative filtering method is based on similarities between the users. The second one depends on content similarities. The last one is a hybrid recommendation system that combine content similarities and user information similarities. In this study, the collaborative filtering method is used.

Recommendation system vary from user to user. In this respect, to find a specific recommendation for the person actually requires having a lot of details about the person. Bringing information that can be explored and suggested in detailed data is a complex problem. For this reason, we have implemented the distributed architecture by taking advantages of user similarities while designing our system. There are many input parameters to capture the relationship between the users. Using the algorithms in MLlib library of Apache Spark, the data vector is processed in parallel and quickly. Learning algorithms are tested on an open data set and new suggestions are presented.

Keywords: Recommendation System, Collaborative Filter, Distributed Machine Learning, Apache Spark

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THERMAL AND FLAME RETARDANT PROPERTIES OF POLY(METHYL METHACRYLATE) REINFORCED WITH ALUMINUM AND CALCIUM HYPOPHOSPHITE

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Abstract:

The fire can lead to death of people and financial losses. To minimize these losses, flame retardant materials are preferred for most applications. To date, various flame retardant additives have been used to improve the flammability of polymers. Among these additives, phosphorus compounds have wide application area in the industry of flame retardant additives for polymer composites. In this study, the influence of two different hypophosphite on the flame retardancy properties of poly (methy methacrylate) (PMMA) were investigated. The composites were prepared by melt blending technique using 10, 20 and 30 wt% of both aluminum and calcium hypophosphite (AHP and CHP). The thermal and flame retardancy properties of composites were investigated using thermal gravimetric analysis (TGA), limiting oxygen index, vertical burning test (UL-94) and mass loss calorimeter. The LOI and UL 94 test results show that the composites containing 20 and 30 wt% of both AHP and CHP, passed UL 94 with V0 rating. Also, all of the composites reached a higher LOI values than that of pure PMMA. The mass loss calorimeter results revealed that the addition of AHP and CHP into PMMA reduced the peak heat release and total heat release, thus increased the flame retardancy performance of PMMA. As observed from the TGA, the residue yield and thermal stability of PMMA increased with the addition of AHP and CHP. Consequently, AHP and CHP increased the flammability properties of PMMA acting gas-phase and condense-phase during combustion.

Keywords: Poly (Methy Methacrylate), Hypophosphite, Flame Retardancy

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EFFECT OF ALUMINUM AND CALCIUM HYPOPHOSPHITE ON THERMAL DEGRADATION AND FLAMMABILITY PROPERTIES OF THERMOPLASTIC POLYURETHANE

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Abstract:

Halogenated flame retardants (HFRs) are widely used to improve the flame retardancy of polymers, but HFRs have been banned in some application areas because they release toxic and corrosive gases during combustion. Recently, metal hypophosphite compounds have been used as the new phosphorus-containing effective flame retardants and they have attracted considerable attention of researchers because of its cost-effective and high-efficiency properties in flame retardancy. The experimental investigation on flame retardant properties of thermoplastic polyurethane (TPU) filled calcium and aluminum hypophosphite (CaHP and AlHP, respectively) were performed in this study. TPU based composites containing different concentration of CaHP and AlHP (10, 20 and 30 %wt) were prepared by melt blending via twin-screw extruder. The flame-retardancy and thermal stability properties of TPU based composites were characterized using limit oxygen index (LOI), vertical burning test (UL 94), thermogravimetric analysis (TGA) and mass loss calorimeter. The char residue after mass loss calorimeter analysis was investigated by scanning electron microscopy (SEM) analysis. These results clearly showed that both AlHP and CaHP enhanced the flame retardancy properties of TPU. The addition of both AlHP and CaHP increased UL-94 test ratings and LOI values of TPU. Mass loss calorimeter analysis revealed that the heat release rate and total heat release of AlHP/TPU and CaHP/TPU composites were lower than those of TPU. Additionally, the results from TGA indicate that the AlHP/TPU and CaHP/TPU composites presented higher char residue than neat TPU. SEM investigations showed that the residual structure for 30 %wt AlHP/TPU and 30 %wt CaHP/TPU composites presented different surface morphologies.

Keywords: Metal Hypophosphite, Flame Retardancy, Thermoplastic Polyurethane

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DISCUSSION OF SUSTAINABILITY INDICATORS IN COAL PRODUCTION

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Abstract:

Although some might claim that finite resources such as coal is not able to afford sustainable development, it is a known fact that coal has become driving force of the world economy since the age of Industrial Revolution and with the reserves in the U.S., China, Australia and India, it is expected to remain so for decades and even centuries depending on the discovery of new coal reserves around the world. Coal mining is a crucial value for many economies, especially for developing nations, where mining's contributions enable them to grow stronger and overcome the challenges of poverty and development. It also plays a major role in the generation of electricity across the globe and in addition, is fundamental in the creation of steel and cement. On the contrary, coal mining has certainly shortcomings of its own. Coal mining, particularly surface mining, requires large areas of land to be temporarily disturbed and this situation leads to raises in a number of environmental hazards, including soil erosion, dust, noise and water pollution, and impacts on local biodiversity.

The importance of sustainable development principles has become an increasing issue within the mining sector over the past three decades. Early work focused mainly on mining metals and commodities other than coal and energy fuels but today, as the sustainability concept is an important consideration for all human endeavors, the coal industry has also become active in sustainability efforts. In this study, the sustainability indicators of coal mining, similar to metal mining and quarrying, were defined and the policies that should be developed to ensure sustainable and cleaner coal production systems were discussed.

Keywords: Coal Mining, Electricity, Growth, Environment, Sustainability.

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ANALYSIS OF SUBSIDENCE OBSERVED AT UNDERGROUND MINE SITES BY GRAVITY METHOD

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Abstract:

Subsidence is a natural phenomenon that occurs as a response to the voids created by extracting solid or liquid material beneath the Earth's surface. It is the downward movement of the surface of the Earth relative to some predefined level and the monitoring of subsidence requires detecting changes in the Earth's surface across a region over a period of time. The impacts of subsidence on the surface are serious for any nearby settlements, infrastructures, surface water and ground water conditions and even on vegatation. There are several subsidence surveillance techniques such as ground-based, space-based and airborne. Among the ground-based methods, gravity method was selected for this study and its efficacy was investigated for the surveillance of subsidence at mine sites, in which underground methods are applied.

The density of rock formations underground is an important parameter in gravitational force and variations in the lateral and vertical components of this parameter lead to occurrence of anomalies. The gravity technique is one of the most crucial tecgniques in geophysics for the measurement and interpretation of these anomalies. It is possible to measure gravity values at a point located in subsurface dependent upon time and distance and particularly, it gets easier to determine the existence of possible openings underground with the help of this method. In this context, in tunnel excavations and in mining areas, in which underground mining systems are employed, the existence and dimension of underground openings can be determined with distance-dependent gravity surveys while surface subsidences resulting from horizontal and vertical displacements is determined with time-dependent measurements.

Keywords: Subsidence, Mining, Underground Opening, Gravity, Geophysics.

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INVESTIGATION OF THE EFFECT RATIOS OF CUTTING PARAMETERS ON THE SURFACE ROUGNESS

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Abstract:

Surface roughness is effective on the fatigue strength, corrosion resistance and friction life of the workpieces. In this experimental study, in the turning operation, parameters affecting the surface roughness of the AISI 4140 alloy were investigated. Cutting parameters; to be cutting velocity (100, 150 and 200 m / min), feedrate (0.125, 0.250 and 0.375 mm / g) and cutting depth (1, 2 and 3 mm) 27 cutting tests were performed. In the experiments, coated tools with a tip radius of 1.2 from Walter Company were used. A separate cutting tool was used for each experiment and formed chip pictures were taken. Surface roughness were measured with the MAHR-Perthometer M1 device. The effect levels of the control factors on the surface roughness was determined using Variance analysis (ANOVA). A model was created with the performed regression analysis. It has been determined that the most important parameter in terms of surface roughness is feedrate.

Keywords: AISI 4140, Turning, Surface Roughness, ANOVA, Regression Analysis

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EXPERIMENTAL INVESTIGATION OF THE CUTTING FORCES IN THE MACHINING OF AISI 4140 STEEL WITH THE CNC TURNING MACHINE

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Abstract:

Cutting force realizes in turning operation is a significant influence on tool wear, surface roughness, dimensional accuracy of parts and heat generation. In this study, the cutting speed, the feedrate and the effects on the cutting force of the cutting depth in the turning process were experimentally investigated. A total of 27 experiments were performed using three different cutting speeds, three different feed rates and three different cutting depths. Kistler 9257 type B dynamometer was used for measuring cutting forces. The Kistler 9257 B type dynamometer was used to measure the cutting forces. After the experiments, variance analysis was carried out to determine the impact rates of the cutting parameters on the cutting force. Relations between dependent and independent variables were determined by the model obtained from the regression analysis. When the obtained experimental and statistical results are evaluated, it has been determined that the most effective parameter on the cutting forces is the feedrate.

Keywords: AISI 4140, Turning, Cutting Forces, ANOVA, Regression Analysis

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AN ALTERNATIVE METHOD FOR LONG TERM LAND COVER CHANGE DETECTION: A CASE STUDY OF HASANLAR DAM

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Abstract

Dams which needed to drinking and irrigation water supply, flood control etc. at first have undertaken an another task with hydroelectric power which emerged from the increasing energy demand due to population growth, technological developments and changes in consumption habits in recent years. This process has accelerated from the 1980s which was the beginning of the increasing trends in renewable energy sources due to the environmental impacts of fossil fuels. However, even though dam type hydroelectric power plant project is a renewable energy, it has some adverse effects on ecosystems. The changing flow regime with the intervention to the river generally results in destruction and fragmentation in the riparian ecosystem. This change in the land cover can lead to modification on the microclimate, thus it can change the hydrological cycle of the basin. For this reason, the monitoring of the change in the land cover at the dam and its surroundings is important for revealing the effects of the project. In this context the Hasanlar Dam in Duzce province was examined in the scope of this study. The land cover change has been determined in two temporal periods through 1:25000 scale topographic maps date on 1960, 1982 and 2013. The land cover which is consist of 4 classes was obtained by visual classification method. The amount of change was determined as the unit by grid method. It was observed that forest areas showed a decreasing tendency after the dam construction during the first temporal period but an increase was shown later. On the other hand it has been determined that non-vegetated areas are transformed into orchard predominantly. As a result, it has been seen that the proposed method can provide an effective analysis for the land cover change detection when old dated aerial photos or satellite images can not be reached.

Acknowledgement

This study is a part of master thesis of the first author. The authors would like to thank Pamukkale University Scientific Research Projects Council for their financial support with project number 2018KRM002-237 to attend the conference.

Keywords: Land cover change, Dam, Hydroelectric power plant, Hasanlar Dam*

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DETERMINATION OF THE EFFECT RATIOS OF THE CUTTING PARAMETERS ON THE CUTTING FORCES USING THE VARIANCE ANALYSIS

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Abstract:

In this study, determining of the effect ratios of the cutting parameters such as the cutting speed, the depth of cut and feed rate on the cutting forces was aimed. For this purpose, the cylindrical AISI 1050 material was machined using uncoated cutting tools. A total of 27 experiments were performed using three different cutting speeds, three different feed rates and three different cutting depths. During the experiments, the cutting forces were measured by connecting the Kistler 9257 B type dynamometer to the tool holder where the cutting tool was located. Variance analyses were performed on the obtained cutting force values. Thus, the effect ratios of cutting parameters on the cutting forces were investigated. As the results of the variance analysis, it was determined that the cutting depth and the feed rate are effective on the cutting force respectively. Experimental results showed that cutting speed has no effect on the cutting force.

Keywords: AISI 1050, Turning, Surface Roughness, ANOVA, Regression Analysis

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ADAPTED COOLING CHANNELS FOR DIFFERENT WALL THICKNESS OF PLASTIC PARTS

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Abstract:

A significant majority of plastic part which is used in all areas of daily live are manufactured by plastic injection molding method. During designing these produced plastic parts, the quality and appearance of molded plastic parts are very important as well as the size, function and suitable according to usage area. Therefore, while designing plastic parts, a lot of limitations are encountered depending on using area. In this context, one of the design constraints for producing plastic parts using injection molding method is regular thickness. In this study, a cooling system was proposed which makes it possible to design plastic parts which do not have regular thickness. For sections having different thicknesses of plastic parts, the cooling channel layout is changed to provide co-cooling for all sections of the plastic part. The distance between the cooling channels is determined by the thickness in the cooled area so that co-cooling can be achieved. Numerical analyzes have shown that thickness-matched cooling channels provide more efficient cooling.

Keywords: Injection Molds, Adapted Cooling Channels, Uniform Cooling, Different Wall Thickness

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INVESTIGATION OF THE EFFECTS OF CUTTING PARAMETERS ON THE SURFACE ROUGHNESS IN THE TURNING OF AISI 1050 STEEL

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Abstract:

AISI 1050 which is one of the unalloyed steels and it is known as carbon steels because of contains the high amount of carbon. In this study, the AISI 1050 steel was machined on the CNC turning machine and surface roughness values were recorded. After that the effects of cutting parameters on the surface roughness were investigated. Furthermore, the effect ratios of the cutting factors on the surface roughness were determined using the variance analysis. In this context, Walter Company branded SNMG120412-NRT WS10 uncoated tools were used to perform the experiments. In the experiments, the cutting speed (140, 170 and 200 m / min), the feed rate (0.15, 0.275 and 0.4 mm / g) and the cutting depth (1.5, 2.5 and 3 mm) were used as the cutting parameters. The Surface roughness was measured with the Mitutoyo SJ-201 device. According to the conducted analysis results, it was determined that the most important parameter is the feed rate in terms of the surface roughness. Other parameters were determined to have no effect on surface roughness.

Keywords: AISI 1050, Turning, Surfaceroughness, ANOVA, Regression Analysis

*Gazi University

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REPRODUCTIVE BIOLOGY OF BLOTCHED PICAREL (SPICARA FLEXUOSA RAFINESQUE 1810) IN THE EASTERN BLACK SEA

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Abstract:

The reproduction biology of blotched picarel (Spicara flexuosa Rafinesque 1810) was studied with 599 specimens sampled monthly along the Southern-East Black Sea coasts (Rize-Artvin) from September 2015 to September 2016. The total length of the females and males were ranged from 10,0 to 20,6 cm and 8,7 to 21,8; respectively. The overall sex ratio was (♀/♂) 2,20. The gonadosomatic index values showed peaks in July for both female and males. Based on the morphologic characteristics of ovaries and testes 5 stages appeared throughout the year. According to the monthly proportion of ovarium and testes the oogenic activity started in June and spawning occurred between July and September. The length of first maturity was determined when over 50% of the sample was mature and was about 12,42 cm for females and 10,78 cm for males. Fecundity ranged between 552 and 1756 eggs (mean 1161±288 eggs) and fecundity-total length relationship was significantly different from zero (p 0,01).

Keywords: Blotched Picarel, Spicara Flexuosa, Reproduction, Black Sea

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INVESTIGATION OF RADIONUCLIDE CONCENTRATIONS IN DIFFERENT TISSUES OF WHITING (MERLANGIUS MERLANGUS EUXINUS) FROM THE EASTERN BLACK SEA COASTS (RIZE/TURKEY)

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Abstract:

In this study, natural (226Ra, 232Th and 40K) and artificial (137Cs) radionuclide concentrations were determined in different tissues (meat, gonad, gill and liver) of Whiting (Merlangius merlangus euxinus) samples. Samples were collected from different local fishermen during the summer season of 2016 from the Eastern Black Sea coastal area mainly Rize province, Turkey. The analysis was carried out to determine 226Ra, 232Th, 40K and 137Cs radioisotopes using a coaxial HPGe detector of 55% relative efficiency and a resolution of 1.9 keV at the 1332 keV gamma of 60Co (Ortec, GEM55P4-95 model). The activity concentrations obtained for 226Ra, 232Th, 40K and 137Cs are given in the unit of Bq/kg. Activity concentration range of 226Ra, 232Th, 40K and 137Cs varied from 0.99±0.05 to 10.36±0.52, from 0.72±0.04 to 10.20±0.51, from 121.21±5.45 to 485.19±25.38 and from 1.07±0.05 to 4.88±0.16, respectively. The activity concentration results of radionuclides were compared with the international limit values and the other studies in the literature.

Keywords: Whiting (Merlangius Merlangus Euxinus), Radioactivity, Hpge, Rize

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EXPERIMENTAL INVESTIGATION OF SUPERCAVITATING FLOWS

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Abstract:

Decreasing the hydrodynamic drag of marine vehicles is the ultimate goal of most academic and industrial investigations. When a solid object penetrates into free water surface at high velocities, a cavity forms behind the object as the water is pushed away due to the entrance dynamics. If the entrance velocity is increased to very high speeds, a larger cavity forms and grows up further due to vaporization, and the object is eventually enveloped by an enormous bubble of vapor. This phenomenon is called supercavitation, and its most interesting effect is the significant skin-friction drag reduction caused by the vapor envelope. The skin-friction acting on a moving solid object is larger by two to three orders of magnitude in water than in air. It is also known that the motion of the objects in supercavitating flows shows nonlinear dynamic characteristics.

In this study, supercavitating flows around semi-sphere shaped objects are investigated based on flow visualization at different cavitation numbers varying between 0.2 and 0.4. The velocity of the test objects were adjusted by changing the exit pressure of the launching mechanism that uses the compressed air. Experimental observations are carried out via high-speed video images in a test tank. The formation of the cavity and its characteristics are obtained from the images. Cavity growth and the drag coefficient of the test objects at various entrance velocities are compared between the cases of uncoated and hydrophobic coated surfaces. Cavity length vs. Cavity number plots are obtained and compared between these two cases. It was observed that the cavity length is increased at all cavitation numbers under the hydrophobic effects.

Keywords: Supercavitation, Cavity, Hydrodynamic Drag

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EXPERIMENTAL INVESTIGATION OF THE HYDROPHOBICITY ON DEPOSITION VELOCITY

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Abstract:

In most applications of solids transport, predicting the deposition velocity is a crucial design parameter. Solid particles of slurry suspension in still water settle freely under gravity, while moving the transporting fluid horizontally maintains the solid particles in suspension. As an easy-to-use experimental setup to observe the change in deposition velocity due to hydrophobicity, a cylindrical Couette flow setup consisting of an inner cylinder that rotates with angular velocity within a stationary concentric larger outer cylinder has been constructed. At low rotation rates, a laminar and stable flow is established when the gap between the cylinders is large enough. Meaning, for low values of Taylor number, the flow is assumed to be two dimensional and axisymmetric. At higher rotation rates, the flow is characterized with circumferential vortices within the annular fluid gap and termed Taylor-Couette flow. These vortices provide radial mixing and reduce the boundary layer thickness.

In this study, the experimental investigation of the change of the deposition velocity under hydrophobic effects are carried out by observing the interactions between the solid particles and the hydrophobic coated walls. Settling of natural sand particles while moving in water-glycerol mixing has been measured using an image processing technique, in which the movement and settling of the particles in fluid can be visualized and qualitatively characterized by using backlight illumination. These measurements are conducted at different Reynolds numbers and Taylor Numbers. We also measure the drag reduction due to the slip on the walls via amperage requirements to maintain the proposed angular velocity. The present experimental study made it possible to show the effect of hydrophobicity on the onset of deposition. The velocity distribution in the flow region between the cylindrical walls changed so that the fluid and the solid particles close to the stationary wall move faster, and similarly they move slower close to the rotating cylinder, due to the slip condition on the wall caused by the hydrophobicity.

Keywords: Deposition, Settling, Taylor-Couette Flow

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EFFECT OF IRON AND MANGANESE ON THE LACTIC ACID FERMENTATION EFFICIENCY

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Abstract:

Lactic acid is a valuable acid regulator and preservative widely used in pharmaceutical, textile, food and chemical industries. There are two isomers as D (-) and L (+). Since only the L (+) lactic acid isomer is found in human metabolism, the microbial production of this isomer has recently attracted much interest. It is intended that the percentage of L (+) lactic acid is high at the end of the fermentation process. In this study, the fermentation medium composition was optimized so that lactic acid could be produced with maximum efficiency. The lactic acid bacteria Lactobacillus casei was used in the lactic acid fermentation process which can convert lactic acid to lactic acid at the highest level. Whey was used as a carbon source that causes environmental pollution and pestle water because of its high carbohydrate and protein content. In order to determine the effect of iron and manganese on fermentation yield, FeCl2 and MnSO4 were used, respectively. The batch fermentation studies were carried out at 37 ° C in an incubator with shaking mode. In the study, the change in substrate (lactose) consumption and the concentration of lactic acid produced over time was investigated and the fermentation efficiency was calculated based on the lactic acid produced. Concentrations of lactose and lactic acid were determined by HPLC. The fermentation experiments showed that incorporation of iron and manganese to the fermentation medium even in low concentrations significantly affected the fermentation process yielding the higher lactic acid as a final product. This result can be attributed to the increase in some enzymes activity and growth rate of Lactobacillus casei by using these metal ions in the metabolism.

Keywords: Lactic Acid Fermentation, Lactobacillus Casei, Iron, Manganese, Fermentation Efficiency

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THE EFFECT OF COMPOSITION AND TEMPERATURE ON THE RHEOLOGICAL PROPERTIES OF CHITOSAN/RESISTANT STARCH BLEND FILM SOLUTION

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Abstract:

In food industry, edible bio-based films offer many advantages because of their biocompatibility with human tissues, aesthetic appearance, barrier properties against pathogenic microorganisms, non-toxicity, biodegradability and low cost. For these reasons, polysaccharide based blend films have attracted particular attention because of their potential to be used as food coating materials to extend the shelf life of different food products. Blending of biopolymers emerged to improve properties of films comprising biopolymer material. Although, there are many studies to develop blend films in literature, there is a lack of parametric and comparative studies focusing on the rheological properties of the film forming solution considering its relation with density-viscosity-temperature. Viscosity of the solution, however have great importance to develop a homogeneous film surface during drying and to exhibit the expected mechanical property. The objective of this study was to investigate the effect of blend composition, temperature and density on the rheological properties of film forming solution. The chitosan/resistant starch blend film solutions were prepared with varying concentrations of the chitosan:resistant starch ratio as 5:1; 5:3, 5:5. The effect of blend film composition on 1) rheological property of the solution in the temperature range of 303-343 K by viscometer & densitometer, 2) film casting properties, and 3) antimicrobial activity of the resultant films against Salmonella, Staphylococcus epidermidis, Esherichia coli and Pseudomonas aeruginosa. It was found that the dynamic rheological measurement of chitosan/resistant starch solution in 2% acetic acid suggested pseudo plastic non-Newtonian behaviour. Different antimicrobial activities of the resultant homogeneous film samples were observed. The antimicrobial activity increased by increasing the chitosan:resistant starch ratio and temperature during preparation of the solution. This can be explained by the temperature effect on the viscosity of chitosan solution which decreases as temperature increases. Physicochemical parameters of polymer blends affect the production cost and profitability of manufacturing process.

Keywords: Chitosan, Resistant Starch, Rheology, Antimicrobial Activity, Edible Film

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EFFECT OF DRYING TEMPERATURE ON PHYSICOCHEMICAL PROPERTIES OF PERSIMMON (DIOSPYROS KAKI) GROWN IN BLACK SEA REGION OF TURKEY

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Abstract:

Persimmon is being cultivated in our country since ancient times and it is mostly grown in Mediterranean, Black Sea, Aegean and Marmara Regions of Turkey. It is very important food source due to the presence of vitamin C, dietary fiber, carotenoids and polyphenols and it has been consumed both fresh and dried. Drying is one of the most important post-harvest processes of agricultural products to keep them for a long time without any degradation, to prevent the development of biochemical reactions and microorganisms that may occur in the products by removing free water in wet products. Drying of fruits can adversely affect the quality of these products. In particular, high-temperature air-dried products may have undesirable changes in colour, texture and taste due to thermal degradation. Therefore, the effect of drying process on the quality characteristics of the product should be investigated. The main objective of this study was to investigate the effect of drying temperature on drying rate, final moisture content, colour, brix and pH of persimmon. Persimmon was obtained directly from Trabzon province in November and kept at -40°C until being used in drying experiments. The samples were dried at 40°C, 50°C and 60°C in an incubator. The weight loss, colour (L*, a*, b* values), brix and pH of the samples were determined throughout the drying process. The drying experiments were conducted until obtaining the final moisture content of the fruit as 30%. The highest drying rate was achieved by drying at 60°C for 38h. While a* and b* values of the samples increased, L* value didn't change significantly during drying at different drying temperatures. On the other hand, total soluble solid increased considerably during drying, varying from 13 Bx° to 57 Bx° for 50 °C in 72h. Significant decrease of pH degree existed in all drying temperatures.

Keywords: Persimmon, Diospyros Kaki, Drying Rate, Drying Temperature, Colour, Brix

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DETERMINATION OF TOTAL PHENOLIC CONTENT AND ANTIOXIDANT CAPACITY OF PERSIMMON (DIOSPYROS KAKI) FRUIT GROWN IN BLACK SEA REGION OF TURKEY

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Abstract:

Persimmon (Diospyros kaki) is a fruit with a rich phytochemical structure composed of flavonol, anthocyanidin, tannin, carotenoid and polyphenols. Its high vitamin content and some special nutrients have very important contributions to the formation of immune system in humans. Its phytochemical constituents make it potentially important antioxidant source. However, the amount of these nutritional and phytochemical constituents in the persimmon fruit may differ according to the geographical region where the fruit is grown. Therefore it is important to evaluate the composition of various bioactive components and their functional properties such as antioxidant capacity which may differ regionally. The main objective of this study was to determine the total phenol content and antioxidant capacity of Persimmon fruit grown in Black Sea Region of Turkey. The total phenolic content of persimmon fruit was determined using Folin-Ciocalteau spectrophotometric method and the results were expressed as gallic acid equivalent (GAE). The antioxidant activity of persimmon fruit was determined by ABTS+ radical scavenging activity method and the antioxidant capacity was expressed as Trolox Equivalent Antioxidant Capacity (TEAC). Total phenolic content of persimmon was determined as 63.09 mg GAE/L. The average ABTS radical scavenging activity of persimmon fruit was 331,62 mg TEAC/ 100gDW. A positive correlation was established between phenolic content of the seed extract and antioxidant activity. The results suggest that persimmon seeds are a novel and interesting natural source of bioactive human health-promoting compounds.

Keywords: Persimmon, Diospyros Kaki, Total Phenolic Content, Antioxidant Capacity, Abts

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THE EFFECT OF B4C REINFORCEMENT RATIO ON MECHANICAL PROPERTIES OF STEEL / AL-B4C CIRCULAR LAYERED COMPOSITES

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Abstract:

The mechanical properties of the metal matrix materials are generally weak. That's why the composite structures must be strengthened by reinforcing with some stronger materials such as steels. In this study, the changing of mechanical properties of circular layered composites which produced in the form of steel/Al-B4C were investigated based on the B4C ceramic reinforcement ratio. In the manufacturing of these composite materials, AISI 4140, Al 2024 alloy and B4C were used as jacked, matrix and reinforcing materials respectively. Preliminary products which obtained by compression of Al2024-B4C powder mixture into steel tubes (powder in tube) were firstly subjected to sintering and then reduced to the desired diameters by circular rolling. By this process, it is aimed to increase the jacked-core interface strength. These circular composite bars were subjected to a tensile test. These tests clearly demonstrate how the tensile behavior of the material changes with the increase of the B4C reinforcement ratio in core material.

Keywords: Layered Composite, Bimetal Rod, Tensile Strength

[*]*This study is supported by Scientific Research Projects (BAP) Unit of Erciyes University*

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INVESTIGATION ON FATIGUE BEHAVIOR OF B4C POWDER SIZE IN AL 6063-B4C COMPOSITES

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Abstract:

In this study, the size effect of the B4C reinforcement paticles was investigated in fatigue behavior of aluminum matrix materials. In the composites produced by the powder metallurgy method, three different sizes of B4C particles were used into the Al 6061 matrix material at 10% volume fraction. Al 6063-B4C powderswere mixture by the 3D mixturer and mixture powders were compressed at 450 MPa to obtain circular billets, which were then extruded into composite bars. The rotational shear fatigue tests conducted with samples obtained from these bars showed that the fatigue behavior of the composite material improved with the increase of B4C size. It was observed that the fatigue behavior of the composite bar having B4C with size of 7 µm was lower than that of the sample having 60 µm size B4C. Moreover, the graphite addition into the composite did not adversely affect the fatigue behavior of the samples. By examining the fatigue sections of the materials, it was tried to reveal the effects of grain size change on the fracture form

Keywords: Composite Material, Fatigue, Sintering, Powder Metallurgy

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INCIDENCE COLORING OF SIERPINSKI GRAPHS

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Abstract:

The incidence coloring of a graph was first introduced by Brualdi and Massey. An incidence in a graph G=(V,E) is an ordered pair (v,e) with v in V and e in E, such that the vertex v and the edge e are incident. The set of all incidences in G usually denoted by I(G). For every vertex v, we denote by I_v the set of all incidences of the form (v,{v,w}) and by A_v the set of all incidences of the form (w,{w,v}). The incidences (v,e) and (w,f) from I(G) are called adjacent if one of the following holds:

1. v=w,

2. e=f,

3. The edge {v,w} equals e or f.

A k-incidence coloring of a graph G is a mapping s from I(G) to a set X of k different colors such that adjacent incidences are assigned different colors. The incidence chromatic number of G is the smallest number k such that G admits a k-incidence coloring. In this study we consider the incidence coloring of Sierpinski graphs S(n,k) and prove that the incidence chromatic number of Sierpinski graphs S(n,3) is 4 when n is greater than 1. Moreover, an alternative proof for the incidence chromatic number of the complete bipartite graph K_{m,n} is given. Algorithms for coloring incidence graphs of Sierpinski graphs S(n,3) and complete bipartite graph K_{m,n} are presented explicitly.

Keywords: Sierpinski Graphs, Incidence Graph, Incidence Chromatic Number.

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CFD (COMPUTATIONAL FLUID DYNAMICS) INVESTIGATION OF EFFECT OF SLOPED LABYRINTH TEETH ON LEAKAGE FLOW

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Abstract:

Gas turbines in turbomachinery are widely used in the energy, aviation and defense sectors. So, each element used in these machines creates a separate work area. From the past to present, prediction of leakage flow has been a great important during possible working conditions in gas turbine engine system performance. It has been shown that the inclination of the labyrinth teeth in the direction of the incoming flow tends to reduce leakage flow with experimental data. In this study, Results were obtained via Fluent, a commercial software containing the turbulence model k-e and the wall function Enhanced Wall Treatment (flow characteristics used in Analyzes). CFD analyzes have been done for flat stator - straight labyrinth teeth and flat stator - sloped labyrinth teeth. It was determined Cr (Clearance) and Sloped Angles as Analyzes parameters. Parameters investigated for Sloped Angles include ; 90 (straight tooth), 70 and 50 degree and for Cr (Clearance) include; 0.127, 0.254 and 0.508 mm. When the results for flat stator-straight teeth were compared with well-known analytical approaches and for flat stator-sloped teeth were also compared with experimental data, It was seen that the results were consistent with them.

Keywords: Gas Turbines, Sealing Elements, Sloped Labyrinth Seal.

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CFD (COMPUTATIONAL FLUID DYNAMICS) INVESTIGATION OF SLOPE ANGLE & LEAKAGE OF THE SLOPPED LABYRINTH TOOTH IN HONEYCOMB SEALS

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Abstract:

Gas turbines in turbomachinery are widely used in the energy, aviation and defense sectors. So, each element used in these machines creates a separate work area. From the past to present, prediction of leakage flow has been a great important during possible working conditions in gas turbine engine system performance.

The honeycomb seal and sloped labyrinth seal which are two separate types sealing element has been combined because of the fact that it was thought that would benefit for leakage flow and this issue is not common in the literature. In this study, Results were obtained via Fluent, a commercial software containing the turbulence model k-e and the wall function Enhanced Wall Treatment (flow characteristics used in Analyzes). CFD analyzes have been investigated about this subject privatized for Cr (Clearance), HCs (Honeycomb Cell Size), Pr (Pressure Ratio), n (Rotational speed) and Sloped Angles as Analyzes parameters. Parameters investigated for Sloped Angles include; 90 (straight tooth), 70 and 50 degree, for Cr (Clearance) include; 0.254, 0.508 and 1.016 mm and for honeycomb cell sizes include; 0.793, 1.590 and 3.175 mm The results show that it is compatible with experimental data. It has been found that the honeycomb effect for low Cr is intended to increase the leakage flux relative to the flat stator, but as Cr increase, leakage flow behaviour has been obtained that it decreases relative to flat stator. The inclination of the labyrinth teeth towards the direction of flow has shown that it is prone to reducing leakage. In case the use of Honeycomb Cell Size 1.590 mm for 0.254 mm Clearance and 50 degree teeth angle, Leakage flow reduces about 7% compared to 90 degree of teeth angle. However, The absolute results depend on the clearance and honeycomb cell size.

Keywords: Honeycomb Sealing, Sloped Labyrinth Seal, Leakage Flow

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DETERMINATION OF THE HIP STEM LOOSENING USING VIBRATION METHOD

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Abstract:

Aseptic loosening is a common problem in total hip replacement surgery. Routine radiological imaging techniques are used for postoperative diagnosis. The alternative technique is required to develop because of the low success rate in current diagnosis techniques. The purpose of this study is to develop the new method to diagnose the aseptic loosening of the stem using vibration technique.

Two different experimental setups were established in this study, vibrational and cyclic loading tests. In vibrational test, the bone-prosthetic models were vibrated from the distal femur at a certain frequency and then the vibration data were taken via accelerometer from the trochanter region of the femur. The vibration data were converted to frequance domain for evaluations. The stability of the femur-prosthesis system was determined by evaluating the fundamental frequency change and harmonics generated at the FFT analysis. In the cyclic loading test, the femur-prosthesis system was forced to fatigue at a maximum amplitude of 1700 N and 1 Hz frequency. After every 5000 cycles in the test, the femoral prosthesis system was connected to the vibrational test and the loosening of the system was considered. After 115000 cycles, the harmonic frequencies were observed and the amplitude value of the fundamental frequency were decreased. The experiments were stoped when the stem were pulled out easily from the femur. As the degree of the loosening increased, the number of the harmonics increased and the fundamental frequency values decreased.

In conclusion, the vibration method can be used as an alternative technique to determine the degree of the hip stem loosening.

Keywords: Aseptic Loosening, Vibration Method, Hip Stem, Alternative Technique

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THE DETERMINATION OF ROLES OF VOCATIONAL DISCIPLINES WITH SOCIAL NETWORK ANALYSIS IN URBAN TRANSFORMATION

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Abstract:

In the successful implementation of urban transformation projects, different occupational disciplines is played an important role. The successful implementation of urban transformation projects will no doubt been possible with specialists of the subject. In this context, when all the provisions of the legislation are examined holistically, in the sense of urban transformation, there are many stages from the determination of project areas to the application and registration of land. For this reason, the production of all types of map-property-information-documents, and the application of plan-project-information and documents produced for this purpose to the land with coordinates in the form of registration basis that can be carried out by the Surveying Engineers in accordance with the provisions of the legislation.

As a result, the urban transformation project is an applied period. At every moment of design, project, feasibility and construction phases; The present time map and current status determination, property analysis for the determination of title deed-cadastre and rights holders, new property formation according to land valuation and ownership of a flat principles, distribution and allocation calculations are the most important processes. However, it should not be forgotten that just as in other zoning applications, an urban transformation project that can not be approved and title deed registration as a bastion will never be completed. In an urban transformation process, a functional network analysis of vocation disciplines will be carried out.

Keywords: Urban Transformation, Social Network Analysis, Vocational Disciplines

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INNOVATIONS COMING THE GENERAL DIRECTORATE FOR LAND REGISTRY AND CADASTRE WITH WEB- LAND REGISTER

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Abstract:

The General Directorate of Land Registry and Cadastre have major duties and responsibilities such as presenting the data on the property within the information systems, solving problems, removing inventory of public and citizen property, preventing tax losses. If the General Directorate of Land Registry and Cadastre is to look at the duties of the title deed;

- To keep on a regular basis the record of land register under the responsibility of the State
- to ensure that all kinds of contractual and non-contractual Land Registry transactions and registration transactions related to real estate are made,
- ensuring that the changes on the registers are followed and inspected,
- to ensure that relevant documents are archived and protected.

6083 numbered Organization Act, 9/4. "The General Directorate is authorized to decide whether to keep records and archives electronically." It's connected to your rule. Moreover, Article 1 of the Land Registry Regulations is defined as "Procedures such as the granting of documents and registration examples that are not subject to official formalities to be determined by the General Directorate may be completed by applying in electronic environment and using other authentication methods including electronic signature.". With these regulations, a web- Land Registry system was created and put into practice as of 12/09/2017 in all the directorateof land registry. Introduction to web- Land Registry system is done by using E-state authentication system and the system is worked with The General Directorate of Land Registry and Cadastre - Land Registry and Cadastre information system sub-structure assurance.With the system established, it is aimed to reduce the workload of the land registry offices, to use human resources more efficiently and efficiently, to provide services in a fast and secure manner, to ensure citizen satisfaction, to discipline and register the real estate agency.In the study, the details of the established web- Land Registry system were examined. The system were taken opinion about the situation in practice by Forming components the directorate of land registry, the real estate agent and the user.

Keywords: Web- Land Register, General Directorate Of Land Registry And Cadastre, Innovations, Real Estate Agent, Web- Land Registry User

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A PRELIMINARY STUDY ON SUITABLE DATABASE TYPES FOR E-VOTING SYSTEMS

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Abstract:

Recent developments in the internet technologies made possible and/or cheaper to carry many services to the Internet. Such that, online polls, petitions and questionnaires have gained vast popularity in the last decade. Contrarily, more comprehensive election systems, called e-voting systems, made little progress and could not be widespread. There are some doubts behind their unpopularity, including authentication issues, privacy concerns, infrastructure costs, and difficulties for design decisions. One of these decisions should be about databases and their properties, since there are several approaches with different pros and cons. Nowadays being called as classical, the relational SQL-based databases, were the predominant choice until the concept of the Internet of things, along with some modern web 2.0 services and the social media, allowed production of mass amounts of dynamic data, called big data. Big data, due to its vast size and dynamism, require special techniques to store and handle. More, within this notion, data can be unstructured, or semi-structured. Thus, non-relational databases, called NoSQL, which also pose subtypes, may be preferred. Furthermore, with the rise of Bitcoin, the very first cryptocurrency, and Ethereum, a similar follow-up project providing some extra features; blockchain systems appear as alternative decentralized database solutions.

This study elaborates different database types considering their characteristics, like optimum size, computational cost, performance, security and flexibility; from the point of view of the e-voting systems. Some recommendations are also made to help deciding the best approach, method or implementation for different e-voting scenarios, and for different parts of e-voting systems. In example; first, the number of the databases must be clarified. One might be for the voter information, one for the candidates and another for the votes/ballots; notwithstanding, all these can be stored in a single database, too. After, one should consider the potential size of the database(s) and the defined data types, as well as the expected number/rate of transactions. Hence, suitable database technologies can be chosen.

Keywords: Blockchain, Database, E-Voting, Nosql

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AN INVESTIGATION ON CHALLENGES IN DESIGNING SMART IOT GATEWAYS

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Abstract:

The Internet is currently evolving into the Internet of Things (IoT). Apart from the computers, smartphones, and tablets; consumer electronics, white goods, transportation vehicles, special purpose sensor/actuator devices and many others are gaining access to the Internet. There may be many types of devices in a smaller portion of the huge Internet of Things. This portion may be a body area, personal area, home area, or even a larger area network. The devices are produced by many vendors, and lack of coordination among them is a serious problem, as well as the lack of standardization for the IoT. Accordingly, each device, which may have different hardware and software, may produce and transmit different forms of data, using different protocols. These protocols include wireless connectivity, security, power control etc. Against all odds, these devices should be able to cooperate and work together in harmony, since they can easily be used in the same network. Furthermore, they may need each other's data, to work correctly. For instance, in a home network, a smart washing machine may need the schedule of the smart dishwasher, in order to avoid operating at the same time. In a more compelling scenario, one of them may use Wi-Fi, while the other uses Bluetooth. We can make things even more complicated by adding a third device, say a noise sensor, which runs on battery and uses ZigBee. Any security countermeasure, like device authentication, will multiply the complexity. Consequently, such heterogeneous networks require extraordinary gateways, to sustain a reliable interconnection and to access the Internet at the same time. There is a limited number of academic studies and commercial projects regarding such gateways, and even fewer of them have successfully been implemented. This study briefly presents the major challenges of designing heterogeneous IoT gateways, considering technical issues like device architectures, connectivity solutions and resource constraints.

Keywords: Gateway, Interconnectivity, Iot, Wireless Sensor Networks

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WATER INJECTION EFFECT TO PERFORMANCE OF GASOLINE ENGINE

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Abstract:

Today and for the upcoming years passenger car transportation will primarily use fossil fuels. Even in ambitious electrification scenarios, a majority of passenger cars will still feature an internal combustion engine beyond 2025. In the future, fuels made from renewable energy could support vehicle electrification in reducing greenhouse gas emissions. Consequently, it is necessary to exploit the entire potential of combustion engines and strive to achieve highest possible efficiency.

In this study, effects of water injection are examined to understand; what extent a water injection (DWI) into the cylinder can have a positive effect on engine performance. This study is aimed to develop 1-D combustion model of three cylinder, four stroke, spark ignited gasoline engine on various engine operating conditions. In the modeling and analyzing process of the the engine; AVL Boost program has been employed and results and documentations have been created in Concerto program. For the sake of the analyzes; Inlet system boundry values was defined the data coming from the dyno.

As a conclusion, at same engine operation, it has been observed that water injection has a positive effect on fuel consumption. Also, cylinder temperature is decreasing. As a result of these effects, it is possible to obtain more torque with the same inlet parameter.

Keywords: Water Injection, Gasoline Engine,

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EVALUATION OF PHYSICAL AND MECHANICAL SPECIFICATIONS OF NATURAL BUILDING STONES IN TERMS OF WATER SATURATION

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Abstract:

In this study, cube samples of marble and travertine blocks obtained from 8 different parts of Turkey are used. The physical and mechanical properties of the samples such as uniaxial compressive strength, ultrasonic P wave velocity, unit volume weight, porosity, water absorption and fill factor were determined. Experimental studies were conducted on both dry and water saturated conditions. Thus, the effect of water saturation was determined in experimental works. Consideration of the effect on water saturation, strength and P-wave velocity is important in terms of usability of natural building stones.

Statistical relationships were established between the results of the experimental work. Simple regression analyzes were performed for each independent variable. The relationship representing the best correlation between water absorption, porosity, unit volume weight, Schmidt hardness value, uniaxial compressive strength, and P wave velocity in dry and saturated condition was determined. Accordingly, the P-wave velocity changes inversely to the porosity, in proportion to the density. Furthermore, depending on the increase in saturation, the compressive strength decreases in the natural building stone where the P-wave velocity increases. The determination of such relationships is important in terms of their use in the natural building stones.

Keywords: P-Wave Velocity, Saturation, Uniaxial Compressive Strength

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THE EFFECT OF FREEZE & THAW CYCLES ON PHYSICO-MECHANICAL PROPERTIES OF TUFF

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Abstract:

Natural stones such as tuff are widely used in areas such as interior and exterior flooring and coatings of buildings and restoration. Many types of tuffs are affected negatively by the atmospheric conditions in the outdoor use because of their porous structure. Freezing-thawing, wetting-drying, wind, moisture and acidic waters are considerably influential on the mechanical and physical properties of these stones.

In this study; the variation in the strength of tuff after the freeze-thaw cycles was examined. For this purpose; approximately 120 cubic samples were prepared from block samples in sizes of 50x50x50 mm. A total of 80 period freeze-thaw cycles were applied. To determine the effect of freezing-thawing in the laboratory environment, the strength of the solid rock samples before and after each 10 freeze-thaw cycles were recorded. In addition, the variation in the value of physical properties based on cycles is also examined. The test results were then analysed statistically. As a result, pre-test physical and mechanical properties of the tuff were affected negatively after the freeze-thaw cycles. This effect becomes more significant after the 10th period of the freeze-thaw cycles. Consequently; how the atmospheric conditions such as freezing-thawing affect the construction in buildings where the tuff is used was determined by the experimental studies in concern. Experimental results have shown that building stones such as tuffs will be affected by atmospheric events when used outdoors and this situation will affect construction negatively.

Keywords: Freeze-Thaw, Natural Stone, Tuff, Mechanical And Physical Properties

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A NOVEL STUDY OF THE CSM NANOFIBER IN TEXTILES

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Abstract:

Nanotechnology is one of the widest used tools for researchers in various disciplines. For example, in textiles there are many studies carried out with the help of electrospinning process on different polymers such as polyethylene oxide, nylon, polyimide, polyaramid, silk fibroin etc. Electrospinning process is well known technique which uses electrical forces to produce polymer fibers at nanometer scale diameters. On the other hand, cress seed mucilage (CSM) is a new source for food science studies. However, CSM has not been reported in textile research yet. CSM is also biodegradable and biocompatible. Therefore it can be interested to use CSM in textile applications. However, chemical composition of cress seed is consisting of around 23% of protein. From this point of view, the main goal of our research is to produce a re-generated protein fiber in nano scale with the use of CSM. This novel study may then be an alternative fiber production with the help of electrospinning process to the wool. For this reason, in this research CSM/PVA nanofibers were produced under different conditions by electrospinning process. The electrical conductivity and viscosity of the produced nanofibers were analyzed. The effect of CSM/PVA volume ratio was evaluated on the produced nanofiber morphology by scanning electron microscope (SEM). It was indicated that PVA acts as an aiding agent to improve spinnability of CSM. Additionally, the strain strength results and their mass area of the produced CSM/PVA nanofibers were examined. To the best of our knowledge, we believe that this current novel study is a first attempt to produce a re-generated protein based fiber in textiles at nano scale.

Keywords: Lepidium Sativum, Cress Seed, Electrospinning, Textiles, Mucilage, Nanofiber

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BIO-HYDROGEN GAS PRODUCTION FROM NON-PRETREATED WASTE PAPER TOWEL BY DARK FERMENTATION

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Abstract:

The fast consumption of fossil fuels led to environmental concerns and investigation for alternative fuels. In this context hydrogen gas (H2) is considered as a clean fuel that offers a promising future in the energy sector. Especially H2 production from wastes enables fuel production beside waste disposal. The objective of this study was to evaluate waste paper towel (WPT) for H2 production by dark fermentation. Effects of WPT concentration on H2 formation were investigated in bench scale batch experiments. Raw WPT solution was directly inoculated with heat treated anaerobic sludge. H2 formation started after about 24 hours in all bottles due to slow enzymatic hydrolysis of cellulose. H2 and total volatile fatty acid (TVFA) formation increased by increasing the WPT concentration. Highest H2 yield (383 mL H2/mLreactor) and final TVFA concentration (3.49 g/L) was obtained at 50 g WPT/L. Moreover, highest TOC removal was obtained as 46% at 10 g WPT/L. Untreated WPT was found to be a potential source for dark fermentative H2 production however, the adaptation period and H2 formation rate could be enhanced by treating the WPT with an effective and environmental friendly process prior dark fermentation.

Keywords: Waste Paper Towel, Dark Fermentation, Hydrogen

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HYDROGEN GAS PRODUCTION FROM DARK FERMENTATION EFFLUENT USING DIRECT CURRENT: EFFECTS OF APPLIED VOLTAGE

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Abstract:

Hydrogen gas (H2) is considered to be one of the cleanest fuels of the future and it is planned to be widely used in vehicles instead of petroleum. However, H2 is not readily available and mostly produced by energy intensive and fossil fuel based technologies. Alternatively, H2 can be produced from waste resources since it is the most abundant element in the universe. In this study, we aimed to produce H2 from the effluent of dark fermentation focusing on both H2 production and reduction of polluting parameters in the effluent. In this context, the effects of applied voltage on H2 production performance was investigated in batch experiments using a DC current supply. All parameters were kept constant except the voltage was varied between 1-7.5 V. Highest H2 production performance was obtained at 7.5 resulting 50 mL H2 / mL reactor with 102.7 mL H2 /h, %68 energy efficiency and pure H2 percentage. The COD removal at this condition was 30%. DC assisted H2 production from the effluent of dark fermentation has potential advantages but requires further investigation to obtain more efficient COD removal and faster H2 production.

Keywords: Dark Fermentation Effluent, Direct Current, Hydrogen

[*]*Authors thank to TUBITAK (113Y184) and PAU-BAP ADEP project for their support.*

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RESISTANCE SPOT WELDING OF FE3AL ALLOY

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Abstract:

Iron aluminides based on Fe3Al and FeAl are excellent candidates to be used as structural materials for high-temperature service conditions. The advantages of these materials include their low cost, low density, and high sulfidizing and oxidizing resistance at high temperatures.

In this study the alloy Fe-28Al was prepared with vacuum arc melting under an argon atmosphere from iron and aluminum with 99.99 wt.% and 99.7 wt.% purity, respectively. The samples were heated to 700 ◦C and rolled. Rolled samples were prepared 10 mm in width and 30 mm in length. The resistant spot welding experiments were carried out by a resistant spot welding machine at different welding times under a welding current of 3 kA. After welding, the microstructures of welding interfaces of the welded samples were examined with optical microscopy and scanning electron microscopy (SEM). The optical microscopy and SEM investigations were revealed that the welding interfaces of the welded samples have smooth morphology without any crack or pore. Tension test of the welded samples was performed out in the universal tension-compression testing machine to determine weld strength. The hardness values were measured from the center of the welding interface to both sides.

Keywords: Resistantant Spot Welding, Fe3Al, Tension Test

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DOES NIGELLA SATIVA BY-PRODUCT SUPPLEMETATION TO LAYER RATIOS HAVE AN EFFECT ON BIRDS' PRODUCTIVITY PERFORMANCES ?

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Abstract:

Performance values were measured in layers fed ratios containing different amounts of Nigella sativa (N.sativa) by-product. The trial was performed at the Humeyra Ozgen Research and Practice Farm, Faculty of Veterinary Medicine, Selcuk University. The experiment was made in cages contained 3 birds/cage. 28 week old 60 Hy-line layers were used in this study. Before starting experiment, the birds were weighted and divided into 4 groups that consisted of 15 birds/each on the basis of LW of birds. Each of these groups consisted of 5 subgroups all of which were included 3 animals. The layers in the groups were fed ratios with 0.5, 1 and 1,5 % N.sativa by-product with the exception of Control group.

The study was ended at 70 days. Its first 10 days was allocated as adaptaion period and following 60 days was the period for actual experiment. By the end of the trial, egg productivities in the groups were 90.48, 90.60, 92.55 & 93.69 %, respectively. Feed Conversion Ratios were also noted as 1.97, 1.96, 1.94 & 1.86 kg.In addition, broken egg ratios, egg weights and LW of layers at the beginning and end of trial were also determibed. We conclude that use of N.sativa by-product in layer nutrition should be further investigated.

Keywords: Layer, Performance, N.Sativa By-Product.

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EGG QUALITY PARAMETERS IN LAYING HENS FED DIETS SUPPLEMENTED WITH PUNICA GRANATUM

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Abstract:

Some parameters on egg quality were measured from layers fed ratios containing different amounts of Punica granatum. A number of 60 Hy-line layers aged 28 week were used in the study. The trial was performed at the Humeyra Ozgen Research and Practice Farm, Faculty of Veterinary Medicine, Selcuk University. The brids were kept in cages each of which was placed with 3 layers. At the beginning of the trial layers were weighted and divided into 4 groups each of which included 15 layer with similar body weights to each other. Each group was composed of 5 subgroup as designed 3 animals per subgroup. Except control group, the layers in the groups were fed ratios with 0.5, 1 and 1,5 % peel of Punica granatum. The study lasted 70 days, the first 10 days was allocated as adaptaion period and following 60 days was the period for actual experiment. Five eggs/group were collected at three times in consequential two days at the beginning and 60th days (end) of the trial and then checked by quality analysis. By the end of the trial, egg weights from groups were 62.14 g, 62.58 g, 62.82 g and 63.32 g. Haugh Unit measured from the groups above were 82.74, 90.58, 86.40 and 85.16. Fracture strength of the eggs in same the groups were determined 34.96, 36.72, 37.64 and 37.88. In conclusion, more detailed studies are recommended on the issue.

Keywords: Laying Hens, Punica Granatum, Egg Quality.

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INVESTIGATION OF HEAT TRANSFER FROM HEATED SQUARE PATTERNED SURFACES IN A RECTANGULAR CHANNEL WITH AN AIR JET IMPINGEMENT

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Abstract:

Heat transfer is a very important precaution for proper design and safe operation of electronic packages and systems. Impinging jets are usually used to solve thermal problems of electronic components in industry due to providing a good heat transfer performance. In this study, cooling of copper plate with five square patterned surfaces inside a rectangular channel comprising of one open and three blocked sides was numerically investigated by using a single air jet flow. The numerical computations were performed by solving a steady, three-dimensional Navier-Stokes equation and an energy equation by using Ansys-Fluent 17.0 software program with k-ε turbulance model. Air was taken as working fluid with inlet temperature of 300 K. A constant heat flux with 1000 W/m2 was applied to square patterned surfaces while the top and side surfaces were adiabatic. The study was carried out for different Reynolds numbers (Re) of 4000, 6000, 8000 and 10.000 and different jet-to-plate distances (H/D) of 4, 6, 10 and 12. The numerical results agreed well with the numerical and experimental datas of study existed in literature. The results were presented as the variations of the mean Nu numbers and temperatures for each square patterned indentation surface. The temperature and velocity distributions of jet fluid flow and mean temperature and Nu values of whole five square patterned surfaces and value of air jet outlet temperature were also researched for different Re numbers and H/D ratios. It was seen that increasing the Re number increases the Nusselt number for all cases. Average Nusselt number increases of 59,28 % from Re=4000 to Re=10,000 for H/D=4. However, Nu number was less sensitive to H/D ratio in the range of H/D=4-12. Average Nusselt number decreases of 9,11 % from H/D=4 to H/D=12 for Re=6000. The highest average Nusselt number was attained for Re=10.000 and H/D=6.

Keywords: Impingement Air Jet, Patterned Surface, Square Channel, Numerical Analysis

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ANALYSIS OF COOLING OF THE HEATED CIRCLE PATTERNED SURFACES BY USING AN AIR JET IMPINGEMENT

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Abstract:

Excessive heating of electronic components may cause undesirable consequences such as increased thermal stresses in the system, which could cause mechanical failure. Impinging jets are usually used to improve thermal performances of the electronic components in industry due to providing a good heat transfer performance. In this work, cooling of copper plate with five circle patterned surfaces inside a rectangular channel composing of one open and three blocked sides was numerically investigated by using a single air jet flow. The numerical computations were implemented by solving a steady, three-dimensional Navier-Stokes equation and an energy equation by using Ansys-Fluent 17.0 program with k-ε turbulance model. Air was taken as working fluid with inlet temperature of 300 K. A constant heat flux was applied to circle surfaces as 1000 W/m2 while the top and side surfaces were adiabatic. The study was done for different Reynolds numbers (Re) of 4000, 6000, 8000 and 10.000 and different jet-to-plate distances (H/D) of 4, 6, 10 and 12. The numerical results agreed well with the numerical and experimental datas of study found in literature. The results were presented as the variations of the mean Nu numbers and temperatures for each circle patterned indentation surface. The temperature and velocity distributions of jet fluid flow and mean temperature and Nu values of whole circle surfaces and value of air jet outlet temperature were also examined for different Re numbers and H/D ratios. It was seen that increasing the Re number increases the Nusselt number for all cases. Mean Nusselt number increases of 64,85 % from Re=4000 to Re=10,000 for H/D=6. However, Nu number was less sensitive to H/D ratio in the range of H/D=4-12. Mean Nusselt number diminishes of 4,48 % from H/D=6 to H/D=12 for Re=4000. The highest mean Nusselt number was achieved for Re=10.000 and H/D=6.

Keywords: Cooling, Impingement Air Jet, Circle Patterned Surface, Numerical Analysis

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EFFECT OF DIFFERENT FEED FORM ON FATTENING PERFORMANCE AND CARCASS CHARACTERISTICS OF JAPANESE QUAILS (COTURNIX COTURNIX JAPONICA)

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Abstract:

This research was conducted to investigate the effects of using compound feed in different physical forms in Japanese quails (Coturnix coturnix japonica) on fattening performance and carcass characteristics. In the experiment, 300 day old chicks were separated into two groups and each group was consisted of three subgroups. During the experiment, two groups were formed by using compound feed in powder and granule form containing 22% crude protein and 3000 kcal/kg ME. Weekly live weights of quails was determined individually, while feed consumption was determined in group level. In the fifth week of the study, a total of 15 male and 15 female quails were slaughtered and carcass characteristics were investigated.

Live weight of the quails in first week were not significant between the experimental groups (P>0.05) whereas in all other weeks the group fed with granular feed had a higher live weight value than the group fed with powder feed (P <0.05). At the end of the fifth week, the live weight values of the granule and powder feed groups were 273.39 and 264.38 g respectively. At the end of fattening period, the total feed consumption was determined as 873.83 and 860.89 g in the granule and powder feed group and the feed conversion rate was 3.20 and 3.26, respectively. Slaughter and carcass weights were higher in the group fed with granular feed, whereas carcass yield was higher in the group fed with powder feed. In terms of internal organs, the granule feed group also had higher values. As a result, it can be emphasized that the use of granular feed in quails gives better results when considering live weight, live weight gain, feed consumption, feed conversion rate and carcass characteristics. When the live weight gain was examined in both experimental groups, it was concluded that the quail fattening period might be appropriate for 5 weeks.

Keywords: Quails, Feed Form, Performance, Carcass Characteristics

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RELATION OF NATURAL BEHAVIOR AND YIELD IN CHICKENS

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Abstract:

People want healthy and natural nutrition, becoming conscious of nature conservation, work towards the protection of animal rights ensured the importance of animal welfare.

As is the case in the world, poultry farming in our country is mostly carried out under intensive conditions. Intensive poultry is carried out in the form of placing the largest number of animals in the smallest possible area under controlled environmental conditions. Standards applied to intensive rearing lead to stress, metabolic problems, physical and behavioral limitations in animals. The intensive breeding system is not suitable for demonstrating the natural behavior of animals. For these reasons, an alternative to the intensive breeding system has been developed, which can demonstrate the natural behavior of animals, and can perform their daily physical activities. Animal welfare; can be defined as a combination of objective and subjective features including health, illness, behavior, care and management practices. In addition to reproductive, nutrition and social behaviors exhibited by chickens, there are also behaviors that are found to be important for welfare. Such as nesting, tuning, searching for food (snatching), dust box, beak cleaning and feather care, flapping and stretching.

In the intensive breeding system chickens can not exhibit their natural behavior and are under constant stress. Stress-induced animals become irritable and damage both themselves and other animals, leading to yield losses. Even so, deaths are often encountered in such cases. The breeders who do this work will be able to know the chicken behavior of the business owners, prepare the environments where the animals will live in welfare, and prevent possible loss of productivity.

Keywords: Poultry, Natural Behavior, Yields

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DATA DEPENDENT TECHNIQUES FOR INITIALIZATION OF CLUSTER PROTOTYPES IN PARTITIONING CLUSTER ANALYSIS

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Abstract:

Cluster analysis partitions data instances into homogenous groups based on some similarity measures. Due to its unsupervised, descriptive and summarizing nature, clustering has become a core analysis in data science for several purposes such as image segmentation, anomaly detection, data classification and compression, and many others. The goal of clustering is that the instances within a cluster be more similar to each other, and different from the instances in other clusters. The quality of final clustering obtained from partitioning cluster algorithms is closely related to the initialization of cluster prototypes. In a partitioning cluster analysis, the choice of initial prototypes be either centroids or medoids is an important task because the quality of final clustering result is very closely related to the appropriate selection of initial cluster prototypes.

Different initializations of prototypes can lead to different clustering results because the partitioning algorithms do not converge to global minima but only to local minima. Hence, choosing an appropriate initialization technique is the first key step in prototype-based clustering analyses. In this paper, based on required iteration counts and computing time we compared the performances of three new simple data-dependent initialization techniques (random samples averaging, systematic sampling and prototyping around the center of a selected feature) vs. two widely used initialization techniques (K-means++ and simple random sampling). According to the results obtained with Fuzzy C-means algorithm on one synthetic and three real datasets, systematic sampling and prototyping around the center of a selected feature were evaluated to be promising techniques in order to reduce the required iterations by the partitioning clustering algorithms.

Keywords: Cluster Analysis, Partitioning Clustering, Prototype-Based Clustering, Initialization Of Prototypes, Data Sampling, Fuzzy C-Mean

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OPTICAL PROPERTIES OF THE ASYMMETRICAL SEMI-EXPONENTIAL QUANTUM WELLS

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Abstract:

This work presents the theoretical study of the effects of non-resonant intense laser field and structure parameters on the optical properties such as linear, third-order nonlinear and the total optical absorption coefficient and refractive index changes related to the intersubband transitions within the conduction band of GaAs asymmetrical semi-exponential quantum well. We are concerned with a theoretical study of the non-resonant intense laser field on the effective confinement potential, the subband energy levels and their corresponding wave-functions for the confined electrons in a GaAs asymmetrical semi-exponential quantum well. Optical properties are obtained by using the compact-density matrix method. The wave functions are obtained by using the effective mass approximation. The energy levels are obtained by numerical method. The numerical results show that the applied non-resonant intense laser field and structure parameters (σ and, V0) have a significant effect on the optical characteristics of these structures, such as the linear, third-order nonlinear and total absorption and refractive index changes. From the findings of this study, it has been concluded that the linear and nonlinear optical properties in a GaAs asymmetrical semi-exponential quantum well under the non-resonant intense laser field can be tuned by changing structure parameters such as the σ and, V0.

Keywords: Semi-Exponential Quantum Well, Nonlinear Optical Properties, Intense Laser Field.

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BINDING ENERGY OF HYDROGEN-LIKE DONOR IMPURITY IN THE ASYMMETRICAL SEMI-EXPONENTIAL QUANTUM WELL

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Abstract:

In this proposed paper, the binding energy of a hydrogenic donor impurity in the asymmetric semi-exponential GaAs-GaAlAs quantum well will be examined as a function of the system's adjustable physical parameters (σ and V0) and impurity position. Within the framework of effective-mass and envelope wave function approximations, the sub-band energy levels and envelope wave functions of the system will be calculated and then the binding energy will be obtained using the variational method. It is shown that the hydrogenic donor impurity binding energy is highly dependent on the structure parameters (σ and V0). We have found that the hydrogenic donor impurity binding energy may be increased or decreased as a function of the impurity position in quantum well. The results obtained were observed to agree qualitatively with other calculations. The impurity binding energy presents characteristic features determined fundamentally by the spatial distribution of the electronic wave function within the asymmetric semi-exponential GaAs-GaAlAs quantum well. The concept might be useful for describing the correct behavior of shallow-donor impurities in QWs with different shapes, and for designing some devices in the future. We hope that this study will shed some light on developing new electronic and opto-electronic devices and their applications utilizing these properties of asymmetric semi-exponential GaAs-GaAlAs quantum well.

Keywords: Semi-Exponential Quantum Well, Impurity.

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PEG SOLITAIRE ON SIERPINSKI GRAPHS

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Abstract:

Peg solitaire game is a one-player board game which traditionally with pegs in every space except for one called hole. If two adjacent pegs x and y are next to hole z, then the peg x can jump over the peg y into the hole in z. The peg y is then removed. The game ends when no further moves are possible. The goal of the game is to remove every peg but one. If this is achieved, then the board is considered solved. Beeler and Hoilman, are generalized peg solitaire game to the graphs. Let G be a graph with vertex set V and edge set E. If there are pegs in vertices x and y and hole in z, then we allow x to jump over y into z such that xy and yz belong to E. The peg y is then removed. A graph G is called solvable if there exists a vertex s, so that, starting with a hole in s, there exist an associated terminal state consisting of a single peg. A graph G is called freely-solvable if for all vertices s, there exist an associated terminal state consisting of a single peg.

In this study, we consider solitaire game on Sierpinski graphs and we show that Sierpinski graphs are freely solvable, that is, graphs that can be solved from any starting position. Moreover, we show that final peg can be left in any vertex.

Keywords: Graph Theory, Peg Solitaire, Games On Graphs, Sierpinski Graph.

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GAME CHROMATIC NUMBER AND GAME COLORING NUMBER OF SIERPINSKI GRAPHS

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Abstract:

In this study we consider a graph coloring game. Let G=(V,E) be a finite simple graph and X be a set of colors. The game chromatic number of G is defined via a two-person finite game. Two players, generally called Alice and Bob, with Alice going first, alternatively color the uncolored vertices of G with a color from a color set X, such that no two adjacent vertices have the same color. Bob wins if at any stage of the game before the G is completely colored, one of the players has no legal move; otherwise, that is, if all the vertices of G are colored properly, Alice wins. The game chromatic number of G is the least number of colors in the color set X for which Alice has a winning strategy.

The game coloring number of G is defined by modifying the rules of the coloring game as follows. The players fix a positive integer k, and instead of coloring vertices, only mark an unmarked vertex each turn. Bob wins if at some stage, some unmarked vertex has k marked neighbors, while Alice wins if this never happens. The game coloring number of G is defined as the least number k for which Alice has a winning strategy.

We find exact values for the game coloring number of the Sierpinski graphs S(n,k) for n is greater than 0 and k is greater than 0. Furthermore, game chromatic number of the Sierpinski graphs S(n,3) is determined.

Keywords: Game Chromatic Number, Game Coloring Number, Sierpinski Graph.

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AN INVESTIGATION ON SHALLOW GEOTHERMAL POTENTIAL OF KUTAHYA, TURKEY

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Abstract:

The rising demand for energy with increasing in population leads scientists to investigate renewable and safe energy sources based sustainable projects. Shallow geothermal energy is one of the most efficient renewable energy sources, and thus the applicability of shallow geothermal systems to many engineering project has become popular in recent years. The shallow geothermal system basically allows the use of low temperature groundwater that placed in shallow depth for heating and cooling processes of buildings via heat pump applications. It is clean, renewable and economical energy system. Widespread usage of this energy as an alternative to the petroleum based fuels would be an important step for decreasing the rate of CO2 emission. The use of shallow geothermal energy can be very efficient in terms of proving both renewable energy and clean environment. Despite of advantages of shallow geothermal, this system hasn't been commonly preferred in Turkey. However, the current energy need of Turkey is provided from unrenewable resources or fossil fuels. Turkey's energy need is mainly imported from neighboring countries. It is thought that the energy dependence of Turkey can be reduced in the case of efficient use of energy by introducing shallow geothermal based projects to the public and private institutions. Considering urgent requirement for renewable energy sources in Turkey, a research program was planned to determine and mapping of the shallow geothermal energy potential of Kutahya. For this purpose, geological, hydrogeological and time dependent variations in climatic conditions based information has been collected to be used in investigation shallow geothermal energy potential of Kutahya city. In the case of data obtained from field studies indicate the suitability of shallow geothermal system construction, this system would be recommended for project area to decrease the cost of energy as well as decreasing CO2 and particular matter emissions.

Keywords: Energy Efficiency, Heat Pump System, Renewable Energy, Shallow Depth, Shallow Geothermal

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THE PRELIMINARY ASSESSMENT OF HEAVY METAL CONCENTRATIONS IN SOILS AROUND YAGCIK VILLAGE AND EMET TOWN CENTER (KUTAHYA, TURKEY).

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Abstract:

Heavy metal accumulation in soil is one of the most serious public health problem around the Emet town center and surroundings where is located on the biggest borate deposit in the world. In previous studies, the concentration of some elements in the region was observed higher than their acceptable limit in the soil especially for arsenic. Although, there have been many studies on arsenic pollution in the region, researches on other heavy metals are quite limited. In this study some heavy metal concentrations were determined in soils around Yagcik village and Emet town center. Eighteen topsoil samples were collected from randomly from the region. Samples were taken from 0-15 cm depth of the topsoil and analyzed for Cd, Cr, Cu, Hg, Ni, Pb, Sb and Zn. A.R. (aqua regia) was used for solutions and the final analyses were performed by ICP-MS technology. Element concentrations in soils varied from 0.16 to 2.08 mg kg-1 for Cd, 14.2 to 49.2 mg kg-1 for Cr, 7.75 to 38.53 mg kg-1 for Cu, 10.0 to 235 mg kg-1 for Hg, 17.6 to 84.5 mg kg-1 for Ni, 7.61 to 107.68 mg kg-1 for Pb, 0.47 to 78.88 mg kg-1 for Sb and 50.2 to 203.8 mg kg-1 for Zn, respectively. Geoaccumulation Index (Igeo) and Enrichment Factor (EF) have been used to evaluate the level of heavy metal contamination in soils. According to Geoaccumulation Index (Igeo) data, the soils were contaminated by Cd, Hg, Pb, Sb and Zn heavy metals. According to EF data, it is observed that soils were enriched by Cd, Hg, Ni, Pb, Sb and Zn heavy metals (especially Cd, Pb and Sb). As a result, concentrations of Cd, Hg, Pb, Sb and Zn in soils are found to be high enough that may cause hazard for the local ecosystem.

Keywords: Soil Contamination; Heavy Metals; Yagcik Village; Emet; Kutahya

[*]This study was supported by Dumlupinar University Scientific Research Projects Unit with project code 2015-37.

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HEAVY METAL TREATMENT BY BIOSORPTION FROM INDUSTRIAL WASTEWATERS

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Abstract:

Heavy metals are very important raw materials for the industries today. So, these materials are pretty much used in various industrial processes. Huge amount of wastewaters containing these metals are formed during the use of them in manufacturing. These wastewaters should be treated carefully to ensure the removal of heavy metals. One of these heavy metals, lead is a very toxic metal found in industrial wastewaters. Several treatment techniques such as precipitation, membrane filtration, liquid membrane, adsorption, ion exchange etc. were applied to remove lead from wastewaters. One of these techniques is biosorption. Biosorption is an adsorption process which uses dead or inactive biomasses. Biosorption process was studied by many researchers to remove heavy metals. In this study, this technique was applied to storage battery industry wastewater to investigate the capability of biomass which is obtained from pepper residual. Also the performance of this biomass on synthetic wastewater was compared with real storage battery industry wastewater. The initial lead concentration was varied approximately in the range of 2.0-4.4 mg Pb2+/L in the real wastewater. At the end of the study it was found that the removal performance decreased with the use of real wastewater due to the complex character of industrial wastewater. So, low lead concentrations and complex structure of wastewater were decreased the treatment efficiency of lead. This work showed the importance of studying with real wastewater.

Keywords: Biosorption, Industrial Wastewater, Pepper Residual, Lead Removal

[*]This study was supported by Pamukkale University-BAP with a project number of 2014BSP023 and PAU-BAP ADEP project.

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A KINETIC STUDY ON LEAD REMOVAL BY MUSSEL SHELL ADSORPTION

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Abstract:

Lead is an important heavy metal that causes various health effects on living materials in aqueous media and also on people exposing to this heavy metal in certain amounts. Lead can be removed from wastewaters by several treatment technologies such as chemical precipitation, ion exchange and membrane processes. Also, adsorption by natural adsorbents attracts much attention. Adsorption is a very important treatment technology which evaluates natural and waste materials in another waste removal process in eco-friendly approach. The materials that adsorbed by adsorbents can also be recovered for reusing purposes. The regenerated adsorbent material can be reused in adsorption process, too. Kinetics of an adsorption process is so crucial, because adsorption is an equilibrium process. The design of the process depends on the kinetics of the adsorption. However, kinetic study provides important information about the mechanism of adsorption. So, a detailed study was conducted to analyze reaction kinetics of lead adsorption by using mussel shell adsorbent. Several adsorption kinetic models were used to make a comparison among the models. Pseudo first order, second order and intra-particle diffusion models were used in kinetic analysis. The equilibrium was obtained at 75 min with a removal efficiency of 91.83%. At the end of the studies pseudo second order model was found suitable to describe the experimental data.

Keywords: Adsorption, Kinetic Study, Lead Removal, Mussel Shell

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ANALYSIS OF RECENT OCCUPATIONAL ACCIDENTS AT SEYITOMER THERMAL POWER PLANT

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Abstract:

Occupational health and safety is one of the most important issues in work life of Turkey as all over the world. The importance given to the concepts of Occupational Health and Safety is directly related to the level of the development of countries, the level of education, culture and consciousness of the individuals who constitute societies.

In this study, the statistical graphs were prepared by analyzing the accidents data of Seyitomer Thermal Power Plant (STPP) occupants in the past years by evaluating the accident frequency, impact level and accident rates, including the most important accident causes. Thus, it is aimed to direct the work safety studies in a good manner and to prevent work accidents by the research results obtained. In addition, the firm will be able to assess its adequacy by appropriately evaluating its occupational health and safety activities by taking advantage of the analytical approach in the study.

Keywords: Occupational Accident, Accident Ratios, Seyitomer Thermal Power Plant

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EVALUATION OF WORK ACCIDENTS RECENTLY OCCURRED IN SEYITOMER LIGNITE CORPORATION (TURKEY)

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Abstract:

Energy has presently become one of the main factors affecting the international relations and the economic, political and social development of the countries. In addition, the increase in energy consumption and the expectation of continuation of this increase cause countries to desire to reach their energy sources cheaply, uninterruptedly and reliably. The coal, which is one of these sources, will become even more important. However, it is of vital importance that the coal is presented in the most economical and safe manner for consumption. Given the fact that the highest occupational accidents are experienced in the mining business, it will be better understood.

There are many ways and means of preventing accidents. But it is also evident that it will be difficult to prevent them without analyzing the origin and cause of the accidents. For this reason, in this study, an analysis of the occupational accidents in the recent years (2015-2017) took place in the work places of Seyitomer Lignite Corporation (SLC), which has about 6 million tons of coal production per year, was carried out. Accordingly, the weight ratio, frequency ratio and probability ratios of the accidents were determined. In this study, it was determined that the accidents were caused by human error in large scale.

Keywords: Work Accidents, Accident Ratios, Lignite Mining

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DECISION MECHANISM FOR GLAUCOMA DISEASE VIA CLASSIFICATION TECHNIQUES BY EMPLOYING DATA REDUCTION

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Abstract:

Glaucoma is one of the eye disorders caused by optic nerve damage leading to partial or complete blindness. If the significant number of nerve fibres is damaged, it creates blind spots in the field of vision. Once nerve damage, it leads to permanent vision loss and it cannot be cured completely. Unlike many other diseases, its symptoms are not immediately noticed by patients. According to World Health Organization (WHO) statistics, it is found that glaucoma is the second leading cause of vision loss globally after cataract, especially in older people. It is estimated that by 2020, there will be approximately 80 million people worldwide affected by glaucoma. Since our vision is possible by the optic nerve, early detection of this disease is essential to prevent any visual loss. The purpose of this study is the diagnosis of glaucoma with fewer attributes. In this study, the patient information which belongs to the graduate thesis of Haciefendioglu, has been employed. Number of the attributes in the dataset has been decreased from 10 to 8 by employing Principle Component Analysis (PCA). The reducted data has been classified by using k-Nearest Neighbourhood (k-NN), Support Vector Machines (SVM) and Naïve Bayes classifiers. 80% of the employed data has been used for training while 20% of the employed data has been used for testing. Experimental results showed that the accuracy rates were significant especially after the usage of PCA.

Keywords: Glaucoma , Machine Learning, Data Reduction, Classification, Principal Component Analysis

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DIFFERENTIAL DIAGNOSIS OF ERYTHEMATO-SQUAMOUS DISEASES VIA MACHINE LEARNING AND DATA REDUCTION TECHNIQUES

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Abstract:

Early diagnosis and appropriate treatment is a necessary problem in health issues. The differential diagnosis of erythemato-squamous diseases is a real problem in dermatology since they all share the clinical features of erythema and scaling with very little differences. These diseases are psoriasis, seboreic dermatitis, lichen planus, pityriasis rosea, cronic dermatitis, and pityriasis rubra pilaris. Usually a biopsy is necessary for the diagnosis but unfortunately these diseases share many histopathological features as well. In this study, Machine Learning techniques have been employed for diagnosis of these dermatological diseases both on the original and reducted data set. For classification, Naïve Bayes, k-Nearest Neighbourhood (k-NN) and for clustering k-means, Rough Set theory have been used. Principal Component Analysis (PCA) has been employed for data reduction. Hence, we aim to detect the disease by considering with fewer attributes. In this study, the used data have been obtained from UCI Machine Learning data set. 80% of the employed data has been used for training while 20% of the employed data has been used for testing. Experimental results showed that the accuracy rates were significant especially inspite of the usage of PCA.

Keywords: Erythemato-Squamous Diseases, Dermatology, Classification, Clustering, Principal Component Analysis

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USING NEWMARK BETA METHOD FOR QUARTER CAR ANALYSIS

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Abstract:

In this study, the interaction between quarter car model and road is presented. According to surface roughness, roads are separated into 8 groups by using ISO-8608 standard. From the least surface rough to the most, these groups are named as A, B, C, D, E, F, G, H, respectively. Quarter Car is modelled as masses, springs and dampers that have linear stiffness and damping coefficients. Vertical displacement, velocity and acceleration are simulated at different vehicle velocities for different road groups in this study. For interaction between dynamics equations of car model and the road, the Newmark Beta method that give us numerical approach is used. 3 types of road groups, namely A, B and C are used. For each group, vertical displacements, velocities and accelerations for both car body and wheel are examined. Simulations are carried out via MATLAB software. According to the result, rougher road surface has higher displacement, velocity and acceleration comparing to the less rough road surface.

Keywords: Quarter Car, Newmark Beta, Road Surface

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VEGETATIVE VARIATION DURING ACTIVE GROWING PERIOD IN STRAWBERRIES

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Abstract:

This study was designed with different growing habit varieties ('Sevgi' , 'Kaska'and 'Fortuna') under Mediterranean climate condition during the 2016-2017 growing period. The aim of experiment were found out the vegetative variation during active growing period at the different varieties. In according with this purpose, leaf number (as trifoliate), crown number and crown diameter during active harvest time (March-May) on monthly basis were evaluated. The domestically growing cultivars 'Sevgi' (48.3) and 'Kaska'(38.7) were reflects significantly higher leaf number than commercially growing 'Fortuna' (13.7) variety. With this result, the balance of generative and vegetative growing of plant on yield obviously determined with well known to have high yield of 'Fortuna' cultivar. Another important factor to effect of leaf number was growing period. There was found a fluctuation on leaf number during active growing period. While, the lowest leaf number (13.2) was observed in March when being lowest air and soil temperature. The highest leaf (48.3) was determined in April when having most suitable climate condition and plant vigor. However, cultivars were shown the decrease in leaf number (33.1) in May due to cleaning of aged and unhealthy leaves. The crown number and crown diameter were shown the same trend with leaf number in evaluated cultivars. Although, the crown diameter and crown number are being important to determine the yield. As our results, the number of leaf more is important than these. According to these founding, breeder should eliminate highest leaf number genotypes due to negative impact on generative growing of strawberry.

Keywords: Crown Size, Cultivar, Fragaria × Ananassa Duch, Leaf Number

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CHANGE OF PHOTOSYNTHESIS RELATED CONTENTS DURING ACTIVE GROWING PERIOD IN STRAWBERRIES

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Abstract:

The experiment carried out at the Horticulture Department field of Cukurova University with domestic ('Sevgi' , 'Kaska') and commercially important foreign ('Fortuna) strawberry varieties under Spanish type high tunnels during the 2016-2017 growing period. Study was investigated the effect of cultivars and growing periods (February-May) on photosynthesis related contents such as SPAD, total chlorophyll, chlorophyll a , chlorophyll b and carotenoid content. It was laid out as randomized complete block combined active growing months with 3 replication. All obtained data were related with Pearson correlation at %5 level of significance. It was found significant influence of growing period on all photosynthesis related contents. While the highest SPAD value (52.5 µmol m-2) was determined in February, all the others show to highest in second month (March). Similar difference was also identified among cultivars in SPAD. The highest SPAD value was found in Fortuna variety with 46.0 µmol m-2 value that could be one of the reason why Fortuna is more fruitful variety. As expected, all parameter reflects positive relation with each other. However, some of them were not significant at % 5 level. The highest correlation was observed between chlorophyll a and chlorophyll b (r= 0.89). As a result, SPAD may be one of the important indicator of fruitful of cultivar and climate condition is also important to determine level of photosynthesis related contents

Keywords: Chlorophyll, Climate, Fragaria × Ananassa Duch, Quality, Spad

*Cukurova University

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COMPARISON OF PSEUDO-RANDOM AND QUASI-RANDOM NUMBER GENERATORS IN THE PERTURBATION-BASED EVOLUTIONARY ALGORITHM

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Abstract:

Perturbation-based evolutionary algorithm uses mutation, crossover and selection operators to provide and maintain the generational variation that is required in the evolutionary process. Mutation operator of the algorithm is achieved by randomly perturbating model parameters at each generation. The main problem in metaheuristic methods is the slowness of convergence speed. So to enhance the global convergence speed and to improve the performance, random numbers are generated by using pseudo random and quasi random number generators in proposed perturbation-based evolutionary algorithm. The performances of the convergence speeds of the two random number generators are compared. When these two random number generations are compared, it is seen that the convergence is faster in quasi-random numbers which have the advantage of low discrepancy sequences. Additionally, quasi-random number generators (Halton, Niederreiter, Reverse Halton and Sobol sequences) show better distribution than pseudo-random number generators according to comparison between the distributions of the number generators in search space. Finally, the perturbation-based evolutionary algorithm with the quasi random number generator which provides relatively better results by the comparisons has been tested on the Rosenbrock and Himmelblau function.

Keywords: Perturbation, Metaheuristics, Quasi-Random, Pseudo-Random, Test Functions

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DETERMINATION OF GRAVITY MODEL PARAMETERS BY USING BAT ALGORITHM

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Abstract:

BAT algorithm which is one of the current metaheuristic algorithms is developed based on echolocation characteristics of the bats. The bats use a kind of radar called echolocation to connect with each other and to define the location of their hunts during the hunting. Bat algorithm, that is increasingly becoming more popular of integration on engineering problems, is applied to a geophysical optimization problem first time with this study. In this study, estimation of gravity model parameters caused by simple-shaped sources is purposed by using the bat algorithm. The algorithm is tested via both theoretical and field gravity data. During the parameter tuning studies, optimum values for the parameter couple of loudness and rate of pulse emission is determined while the population number is kept constant. Based on the success on the estimation of model parameters it is concluded that the bat algorithm can be used for the solution of geophysical problems.

Keywords: Gravity, Geophysics, Bat Algorithm, Metaheuristics, Model Parameters

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THE EFFECTS OF DIETS CONTAINING DIFFERENT LEVELS OF OLIVE CAKE ON SOME BLOOD PARAMETERS OF LAMBS

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Abstract:

In this study, effects of diets containing different levels of olive cake on values of total protein, ALP (alkaline phosphatase), calcium, triglyceride and glucose in blood of lambs were examined. In the experiment, a total of 36 Kivircik male lambs, 3-3.5 months old, were used. The lambs were assigned to 3 groups according to body weight randomly in equal numbers. Each animal was housed in the individual pen. 12 animals in each group consumed different diets. Lambs were fed a diet containing 0% olive cake (OC O), a diet containing 12.5 % olive cake (12.5 % OC) and a diet containing 25 % olive cake (25 % OC) ad libitum. Alfalfa hay was allowed to consume as 83.77 g DM/animal/day. The experiment lasted for 56 days. The blood samples were taken from all animals at the end of the experiment. Only alkaline phosphatase values from the blood parameters were observed to increase with increasing levels of olive cake ($P<0.01$).

Keywords: Olive Cake, Lamb, Blood Parameters

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GEOPHYSICAL METHODS AS A TOOL FOR FAULT ZONE INVESTIGATIONS

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Abstract:

The characterisation of a buried fault system is a crucial point in recognition of geological structures in the active tectonic zones. One way of obtaining subsurface characterisation is undoubtedly the use of geophysical methods. Fault geometry, sediment thickness, tectonic characteristics of shallow subsurface and paleoseismological trench location could be thoroughly determined using geophysical methods such as Ground Penetrating Radar (GPR), Electrical Resistivity Tomography (ERT), Seismic Refraction Tomography (SRT), Very Low Frequency electromagnetic (VLF), magnetics and self-potential (SP). Thus, the geophysical methods have become a major tool for fault zone investigations. This study aims to define the location of fault zones and other geological structures related with faulting mechanism in the survey areas and introduces the results of geophysical and paleoseismological investigations carried out in the vicinity of Izmir city, Turkey. We applied different geophysical methods, which can be effective for exploration of shallow geological structures covered by fine Holocene and Quaternary formations. In this study, used geophysical methods were ERT, GPR, SRT, magnetics, VLF and SP. According to these methods, we performed various data processing and evaluation techniques, and then, we revealed physical changes related to faulting mechanism. Subsurface images produced in two and three dimensions were very helpful in our interpretations at this point. Overall geophysical approaches gave us important results about the geological layers and fault characteristics in the survey areas. Thus, we could rate these methods according to difficulty level during the survey and contribution to interpretation. In addition, integrated interpretations of geophysical surveys allowed us to determine optimal trench locations for paleoseismological studies. The main geological properties associated with faulting process obtained after trenching. Consequently, correlation between the results of geophysical methods and trenching studies enabled to describe the fault zone in detail.

Keywords: Geophysics, Fault, Active Tectonics, Paleoseismology, Ground Penetrating Radar, Electrical Resistivity Tomography, Seismic

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OPTIMIZATION OF STEADY STATE FLIGHT PARAMETERS FOR A GIVEN TRIM CONDITION

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Abstract:

This study is aimed to optimize aircraft trimming equilibrium states by using heuristic and evolutionary numerical optimization algorithms. Determining aircraft equilibrium states are difficult to deal with nonlinear flight dynamics and complexity for a defined trim condition. Aircraft dynamic equations of motion are highly nonlinear to specify desired output states and input states. Furthermore, trimming is very useful and important control mechanism to achieve steady flight for specific flight envelope. Finding best control signals for a specific trim condition can be considered as a numerical optimization problem. Evolutionary optimization algorithms are very useful to find global minimum for complex nonlinear functions. This algorithm has been developed inspired from nature. In this study, evolutionary algorithms have been proposed to find optimal aircraft states. Performance of evolutionary algorithms have been comparatively evaluated with other studies. Consequently, the behaviors of the algorithms show that the evolutionary algorithm is reasonable for optimization of the aircraft parameters.

Keywords: Evolutionary Algorithm, Trimming, Steady State

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GROWTH AND CHARACTERIZATION STUDY ON STRAIN BALANCED QUANTUM CASCADE LASER STRUCTURES

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Abstract:

Semiconductor-based lasers are used in many areas as CD-DVD players, laser printers, barcode scanners, chemical agent detection, and fiber optic communications. Depending on the usage, lasers are chosen in the required wavelength range. Semiconductor lasers that use GaAs, InP are working in the range of Near Infra-Red (NIR) (0.7-1.55 µm) with high power and high efficiency. But the (MIR) Mid Infra-Red and (FIR) Far Infra-Red regions are off limits of these lasers because of their low efficiency and low power. The type of semiconductor lasers that will be used satisfactorily in this range are Quantum Cascade Lasers (QCL) and they are studied extensively. InGaAs/InAlAs based QCL structures are very popular for mid-infrared wavelength emission range applications. They have attractive properties such as high power, continuous wave operation at room temperature and wide tunability. Along with the deposition of thin, ternary layers having exactly targeted thicknesses, precise control of alloy composition and sharp interfaces are among the most important issues of QCL structure growths. In this study, we have grown InGaAs/InAlAs based short wave quantum cascade laser structures by MOCVD and deeply analyzed their structural quality by HRXRD.

Keywords: Quantum Cascade Laser, MOCVD, Structural Quality

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ASSESSING PHYSICAL PROPERTIES OF DENIM FABRICS INCLUDING WOOL/ELASTANE DUAL-CORE YARNS AS WEFT

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Abstract:

Among all the textile fabrics, no other fabric has received such a wide acceptance as denim. The denim fabric has been used extensively by people of all ages, classes and genders. Denim is a hard wearing cotton twill fabric, traditionally woven with indigo dyed warp and white filling yarns. Its manufacture involves the same classical principles which have been followed since its creation, but technological advances have transformed it into a highly fashionable material. One of the technological advances in denim fabric is the using of various hybrid yarns (Elastan / Cotton, PET / Cotton, PA / Cotton etc.) in denim fabric production. Hybrid yarn is a yarn structure developed to benefit from the properties of two or more different components at the same time.

In this study, five different fabric types with different weave types and weft density is produced by using innovative dual-core spun yarn (1st core-wool yarn, 2 nd core-elastane filament and cover fiber-cotton) as weft and Ne 14 cotton yarn as warp.

The elasticity and growth of fabric samples were measured and evaluated. The results indicated that the weft density and weaving type are significantly effective parameters for the elasticity and growth values of denim fabrics.

Keywords: Dual-Core Yarn, Wool Yarn, Elastane, Denim Fabric, Growth, Elasticity

[*]This study is supported by Research Center of the Erciyes University

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THE INVESTIGATION AND ANALYSIS OF ELECTRONIC MONITORING SYSTEM COMPONENTS

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Abstract:

Electronic monitoring system, that enable suspects and defendants to be monitored in the community through electronic communication method, is a technology that is used in execution of the penalties mostly in the developed countries. This system provides freedom from supervision when a sentence is carried out within the community. The use and importance of this technology in Turkey, as a developing country, increases day by day. In this paper, electronic monitoring applications both in Turkey and in the world have been analyzed in consideration of freedom from supervision. Descriptions of technologies used in electronic monitoring systems are presented and classified according to system components. Field monitoring, location monitoring and alcohol monitoring systems are described along with the electronic components used in these. The economic cost analysis of electronic monitoring systems is presented in detail. In addition, the topological structure of the electronic monitoring system used in Turkey is explained in details.

Keywords: Electronic Monitoring, Probation, Electronic Braclet, RF Monitoring,GPS Tracking,Alcohol Monitoring.

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ICENS 4TH INTERNATIONAL CONFERENCE ON ENGINEERING AND NATURAL SCIENCE
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ANALYSIS OF ENERGY CONSUMPTION AND APPLICATIONS OF NEW TYPE CABINETS USED IN ELECTRONIC MONITORING SYSTEM

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Abstract:

Electronic monitoring system provides freedom from supervision when a sentence is carried out within the community. The use and importance of this technology in Turkey, as a developing country, increases day by day. Some countries used this system to execute the punishments more effectively, while in some countries they used it as an alternative system instead of prisons for economic reasons In this paper, daily, weekly and monthly recorded tables and graphs of the voltage, current, frequency, power and power factors of the energy system of the whole system in Turkey are presented in graphs and graphics after the new arrangements made in the cabinet systems where the electronic monitoring systems are connected. In addition, the object oriented programming interface was developed in the Matlab GUI software environment, which is recommended for new system integration. All energy consuption analysis results of new cabinet system used in electronic monitorin system are presented comparatively.

Keywords: Electronic Monitoring,Cabinet Systems,Energy, Probation, Electronic Braclet

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HARDNESS EFFECT ON VIBRATION CHARACTERISTICS OF A THREE-LAYERED COMPOSITE BEAM WITH A VISCOELASTIC CORE

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Abstract:

In the recent years, studies on damping and loss factor properties of composite sandwich beams increase in automotive world. On one hand, for the analytical works on three-layered composite beam with a rubber core, Pawlus may be addressed. On the other hand, for the numerical and experimental researches, present a finite element model and experimental evaluations of the layered composite beam with a rubber core respectively.

In this study, hardness effect on vibration characteristics of a three-layered composite beam with a viscoelastic core is investigated both numerically and experimentally. For this purpose, a numerical model is proposed. Then, experimental evaluations are completed as follows: Fundamental natural frequency is measured such that an impact hammer with a force transducer (Model No: 5800B2, Dytran Instruments, Inc., USA) is used to excite the three-layered composite beam with a viscoelastic core through the selected point. After the excitations, the responses are obtained by an accelerometer (Model No: 3093B, Dytran Instruments, Inc., USA). The vibration measurements are completed using a microprocessor-based data acquisition system, namely SoMat™ eDAQ-lite and nCode GlyphWorks software (HBM, Inc., USA). Effect of hardness of the viscoelastic layer on modal characteristics is examined.

Related experimental results are compared with the numerical ones. Results of the proposed model coincide with those of the experimental evaluations.

Keywords: Three-Layered Composite; Rubber-Steel Interface; Hardness; Vibration

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VIBRATION ANALYSIS OF A MULTIPLE-LINE WELDED ALUMINUM PLATE UNDER COMPRESSION

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Abstract:

In the recent years, investigations on welded line behavior of a multiple-line welded aluminum plate under static and dynamic loading increase in aerospace and automotive worlds.

In this study, welding parameter effect on vibration characteristics of a multiple-line welded aluminum plate is investigated both numerically and experimentally. For this purpose, a numerical model is proposed. Then, experimental evaluations are completed as follows: Fundamental natural frequency is measured such that an impact hammer with a force transducer (Model No: 5800B2, Dytran Instruments, Inc., USA) is used to excite the multiple-line welded aluminum plate through the selected six points. After the excitations, the responses are obtained by an accelerometer (Model No: 3093B, Dytran Instruments, Inc., USA). The vibration measurements are completed using a microprocessor-based data acquisition system, namely SoMat™ eDAQ-lite and nCode GlyphWorks software (HBM, Inc., USA). Welded line effect on stress intensity factor, strain energy density and modal characteristics is examined by considering three different welding parameters. Results are given in tabular and graphical forms.

Keywords: Aluminum Plate; Welding; Inclusion; Vibration; Stress Intensity Factor; Elastic Strain Energy

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INVESTIGATION OF COST EFFECT TO OPENNESS IN CONCRETE DECK SUSPENSION BRIDGES AND CABLE STAYED BRIDGES

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Abstract:

Suspension and Cable Stayed bridges are the most commonly used building systems. The most important factor in the development of suspension and Cable Stayed bridges are steel cables. The effect of increasing traffic load is increasing bridges manufacturing. Therefore, the economics of various bridge construction techniques are being investigated for economic bridge design.

In the world, the costs of suspension bridges and cable stayed bridges were very controversial. The cost of these bridges according to different openings also shows much difference. For this reason, our study is to investigate the effect of bridge openness on cost in both types of bridges.

In this study; Analyzes and designs of suspension bridge and cable stayed bridges with concrete deck of 250, 500, 750, 1000, 1500, 2000 meters were realized and cost analysis of bridge types was realized. In this content, six numbers of bridges in both system types has created three-dimensional models with CSI Bridge Program and numerical analysis was performed. The results of the cost analysis obtained at the end of the study were compared and evaluated.

Keywords: Suspension Bridge, Cable Stayed Bridge, Bridge Cost, Csi Bridge Program

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ANALYSIS OF 3-STORY STEEL STRUCTURE SYSTEMS BY STATIC PUSHOVER METHOD

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Abstract:

The safety of the structures in case of possible earthquakes is important. In recent years, various methods have been developed to determine the structural safety under earthquake loads. The static pushover analysis method is one of these methods. Inelastic behavior of the building systems can be examined with this method. The behavior of the structures under the lateral loads can be achieved very successfully using pushover method.

In this study, static push analysis of 3-story steel structure systems was carried out. Analysis of 7 steel frame systems was carried out. Structural systems are systems with different steel cross members. Static analysis was performed using the SAP 2000 Program. FEMA (Federal Emergency Management Agency) and ATC Applied Technology Council) codes were used when analyzing with Sap 2000 program. Base shear forces and displacements were obtained at the end of the analysis. The obtained analysis results are compared. Finally, the results obtained are interpreted.

Keywords: Static Pushover Analysis, Steel Structures Sistemse, Eearthquake Loads

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PREPERATION OF FIBERBOARDS FROM MIXTURE OF COTTON WASTE AND RED PINE WOOD FIBERS

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Abstract:

Cotton, (Gossypium hirsitum) is an annual plant of the genus Gossypium is from Malvaceae family and a cultivated species. However, raw cotton is known as a plant with the highest amount of cellulose (95-99%) in the plant world. It contains much lesser amounts of fats, waxes, pectin, protein and related simple nitrogen compounds. There are two kinds of fibers for raw cotton. The longer one is called fiber and the shorter one is called linter. Typically cotton's fibers used in textile and related industries while the linter is used for making gun powder, animal food, bedding and filling purposes. However, in general, there is approximately 15% of cotton waste generated during the collection or transportation to main industrial uses (i.e. textile). However, forest products industry has growing interest for using non-wood raw material sources for paper and composite industry. In this sense, cotton wastes alone and/ or with mixture of wood fibers/chips could be useful.

In this study, various proportions of cotton waste materials (10-90%) have mixed with red pine (pinus buritia) fibers with using 10% urea-formaldehyde resin to produce fiberboards in laboratory conditions.

It is also realized that cotton waste proprtions in board structure has usually lowering effects on modulus of rupture. But the highest MOR value of 5.82N/mm2 were found the boards that manufactured with 1:1 cotton waste/wood mixture. The similar results have also found for MOE vaues of boards. It is interesting to note that board that produced from 80-20% (Wood fiber/cotton waste) shown only higher Internal bond properties rather that standard value. These could be partially explained that cotton fibers (cotton waste) has more porous structure that wood fibers and these may effects on further sucking of glue resulting insufficint glue during bonding/hot pressing process.

Keywords: Cotton Waste, Fiberboards, Mechanical Properties, Composites

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THE INSULATION PROPERTIES OF INORGANIC BONDED LIGNOCELLULOSIC COMPOSITE MATERIALS

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Abstract:

Composites made from lignocellulosic materials create enormous opportunities to match product performance to end-use requirements. However, these products have also been produced with combining other raw materials, such as plastics, gypsum, and concrete, into products with unique properties and cost benefits. Although formaldehyde based lignocellulosic composites have wide variety and well defined products, inorganic-bonded composites have also become important products especially in hausing and construction industry. However, inorganic based composites could be classified into three main categories: gypsum, magnesia cement, and portland cement. Gypsum, magnesia and portland cement based lignocellulosic composite materials have already been used to manufacture various type of products. These inorganic binders are usually used to produce from medium density (360 to 800 kg/m3) to medium-high density (800 to 1,350 kg/m3) particleboard and fiberboards. However, fiber-reinforced gypsum panels are typically stronger and more resistant to abrasion and indentation than paper-faced drywall panels and also have a moderate fastener-holding capability. Moreover, cement bonded composite panels are heavier than conventional wood-based composites but lighter than concrete. Therefore they can replace concrete in construction, specifically in applications that are not subjected to loads. Magnesia cement is a low density panel made for interior ceiling and wall applications as well.

The vast of literature on inorganic based lignocellulosic composite has already been reviewed and pointed by a number of researchers. Some excellent bibliographies provide a thorough index to the literature on these products. It is important to note that because of strong competition from other lignocellulosic materials and cost considerations, markets for these products have not been in great demand compare to conventional formaldehyde based wood composite materials. However, efficient insulation properties may create a new industry by making a valuable products.

Keywords: Lignocellulosic Composites, Insulation Properties, Wood, Inorganic Binders, Gypsum, Magnesia, Portland Cement.

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DETERMINING OF THE ENVIRONMENTAL OBJECTIVES FOR SURFACE WATER BODIES ACCORDING TO EUROPEAN WATER FRAMEWORK DIRECTIVE: BUYUK MENDERES BASIN, TURKEY

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Abstract:

Aim of the study: In this study, the environmental targets were determined and detailed according to the European Water Framework Directive (EU WFD) in the Buyuk Menderes Basin (BMB). Results: The main objective stated in the WFD is; to ensure that surface water bodies reach good chemical and good ecological water status. In order to determine the environmental targets, physicochemical, chemical, biological and hydromorphological monitoring were carried out in the basin and the states of the water bodies were determined. Biological, physicochemical, specific pollutants, biologic and hydromorphological evaluations had been put forward in assessing the ecological condition of water bodies and ecological condition had been determined with the worst principle. In assessing the surface water (final state) of water bodies, the worst principle approach was used by evaluating the evaluations of the priority substances (chemical status) together with the ecological evaluations. In assessing the status of water bodies; I. assessment of ecological and surface water conditions at common stations where all components of the monitoring are made, ii. ecological and surface water assessment approaches have been used at stations where some of the monitoring components have been carried out (only biological / hydromorphological, only physicochemical and chemical, only chemical monitoring) and others have participated in some acceptance evaluations. According to the WFD, biological quality elements are the decision makers in the classification of the final water status of surface water bodies. It is necessary to take into account the parameters of hydromorphological and physicochemical and chemical quality elements in order to support the biological quality elements. The main objective of the ecological classification is to determine the sudden and unexpected changes in the living populations of the aquatic environment, where the aquatic biotin is subject to degradation, constituting the main objective of the ecological classification. Three approaches are used to classify the ecological situation: 1) The ecological status of the water body is classified as "Bad / Weak", even if the hydromorphology is "Good / Very good" in a water body where the biological condition is "Bad / Poor" and the status of physicochemical / specific contaminants is "Good / Very good". 2) Biological quality status is determined, the status of physicochemical / specific contaminants, or the classification of the water body in cases where the hydromorphological classification is "Unknown", is based on biological classification only. 3) Classification of stations with biological status "Unknown" and physicochemical / specific pollutants with status "Failed" (under good condition = medium) can also be done. In this approach, even if the biological state of the water mass is to be regarded as "Good / Very good", the ecological condition of the water mass, which is physicochemically known as "Moderate", is regarded as "Medium".

Keywords: Buyuk Menderes Basin (BMB), Environmental Objectives, European Water Framework Directive (EU WFD), Monitoring, Surface Water, Tu

*We thank to the 112G021 KAMAG TUBITAK Council Project for providing of the work described in this study

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DEVELOPMENT OF METHODOLOGY FOR THE DETERMINATION OF ENVIRONMENTAL OBJECTIVES FOR SURFACE, COASTAL AND TRANSITIONAL WATERS: BUYUK MENDERES BASIN, TURKEY

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Abstract:

The main objective of the article is to monitor chemical, biological and hydro-morphological situation of water bodies in Buyuk Menderes Basin, Turkey to determine ecological and chemical classifications, to define the environmental objectives, discharge criteria, programmes of measures in order to protect of the basin and improve the water status. Fresh water sources have been consumed drastically mainly due to industrialization, population growth, long-term draught periods, pollution from industrial and agricultural activities. European Water Framework Directive (WFD) focus on providing sustainable management of water resources to protect water resources and the main objective of WFD is to achieve “good water status”. Surface, coastal and transitional waters must achieve “good ecological and chemical status” to protect human health, water supply, natural ecosystems and biodiversity. The methodology for the determination of environmental objectives for surface, coastal and transitional waters should contain 4 main work packages. The first work package consists of the identification of the data. It covers geographic information systems (GIS), remote sensing and various modelling methods. The second work package covers monitoring physicochemical, biological and hydro-morphological parameters to determination of chemical and ecological status. The third work package classification of water bodies and water bodies status. The fourth work package includes the environmental objectives and assessment of programmes of measures. The outcomes of this methodology examines with guidance documents of the European Union as reference to comply with the requirements of WFD.

Keywords: Buyuk Menderes Basin, Ecological Status, Environmental Objectives, Turkey, Water Framework Directive (WFD).

Acknowledgements: We thank to the 112G021 KAMAG TUBITAK Council Project for providing of the work described in this study.

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COMPREHENSIVE MOLECULAR DESCRIPTIONS OF 3-BROMOPHENYLBORONIC ACID (3-BRPBA) AND INDUCTION OF CASPASE-DEPENDENT APOPTOSIS GENE EXPRESSION LEVELS IN 3-BRPBA TREATED HELA CELL LINE

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Abstract:

In this study 3-bromophenylboronic acid molecule investigated by theoretically and experimentally. In addition we determined caspase-dependent apoptosis gene expression levels in 3-BrPBA treated HeLa cell line. The experimental data were recorded, FT-IR (4000–400 cm–1) and FT-Raman spectra (3500–10 cm–1) in the solid phase. The theoretical calculations are computed DFT/B3LYP/6-311++G(d,p) basis set. The cytotoxic effects of 3-BrPBA on HeLa cells were evaluated by means of the Cell Proliferation Kit (XTT) according to the manufacturer's instructions. HeLa cells were seeded into 96-well plates (Greiner) at a concentration of 5.0x104. According to the instructions of manufacturer, XTT reagent was added after the cells were exposed to 3-BrPBA, for 72h. To determine caspase 2,3,4,6,8,10 and 14 gene expression levels , total RNA content was isolated by trizol reagent according to the manufacturer's instructions. cDNA was synthesized from 1 ug of total RNA and random hexamer primers. The expression levels of caspase genes were shown using qRT-PCR. The cell viability of control groups was considered 100%. IC50 values of 3- BrPBA molecule was found 22 µM. According to the these results harmful effects of cancer cells in metabolism can be decreased by using 3-BrPBA molecule. Depending on the gene expression results, caspase 2, 4, 6, 8 genes significantly overexpressed in 3-BrPBA treated HeLa cells with respect to control HeLa cell line. With the data obtained from this study, 3-BrPBA can be new therapeutic candidate molecule for cancer therapy.

Keywords: Hela Cancer Cell Line, Antiproliferative Properties, 3-Bromophenylboronic, FT-IR, FT-Raman, Caspase Genes Expression Levels

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QUANTUM MECHANICAL CALCULATIONS OF 4-BROMOPHENYLBORONIC ACID MOLECULE (4-BRPBA) AND EFFECT OF 4-BRBPA ON THE EXPRESSION OF BNIP3 (BCL2 INTERACTING PROTEIN 3) IN CANCER CELLS

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Abstract:

In recent years boronic acid ligands have been used in different areas, such as biological, pharmaceutical, industrial, and various other applications. There are a lot of boronic acid-related cancer researches in the literature. This molecule aroused interest of researchers. Boronic acid derivatives used in anticancer therapy both as boron neutron capture therapy (BNCT) and chemotherapeutic agents. Our study focused on a cytotoxic effects of 4-bromophenylboronic molecule on HeLa cells. The cell viability of control groups was considered 100%. IC50 values of 4-BrPBA molecule was found 1,5 µM. In the other part of our work we investigated experimental and theoretical vibrational spectra of 4-BrPBA molecule. To determine BNIP3(expression levels , total RNA content was isolated by trizol reagent according to the manufacturer's instructions. cDNA was synthesized from 1 ug of total RNA and random hexamer primers. The expression levels of BNIP-3 were shown using qRT-PCR. According to the results, BNIP3 significantly upregulated (20 fold) in 4-BrPBA treated HeLa cells with respect to control HeLa cell line. According to obtained results, 4-BrPBA may have potantial to be developed as a novel therapeutic agent against cancer.

Keywords: Hela Cancer Cell Line, Antiproliferative Properties, 4-Bromophenylboronic, FT-IR, FT-Raman, BNIP-3 Gene Expression

[*]*This work was supported by Ahi Evran University Scientific Research Projects Coordination Unit. Project Number: FEF.A4.18.013*

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SYNTHESIS OF HALLOYSITE-REINFORCED ZWITTERIONIC SULPHOBETAINE NANOCOMPOSITE HYDROGELS

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Abstract:

Novel nanocomposite hydrogels were synthesized via free-radical polymerization in the presence of N,N-methylene bisacrylamide as a crosslinker. Halloysites are eco-friendly and low cost natural minerals which are non-toxic to humans. Their general formula is Al4Si4O10(OH)8 .4H2O. One dimension halloysite nanotubes are unique and versatile an inorganic nanofillers with a predominantly hollow tubular structure with diameters typically smaller than 100 nanometers. They have the ability to disperse uniformly in a polymer matrix. To enlarge the inner wall of nanotubes, sulfuric acid was used to dissolve alumina sheets from halloysite. The modified halloysites were incorporated into zwitterionic (2 - ((methacryloyloxy) ethyl) dimethyl- (3-sulfopropyl) ammonium hydroxide) hydrogel matrix. Fourier Transform Infrared Spectroscopy (FTIR) and Scanning Electron Microscope (SEM) were performed to provide structural and morphological information about nanocomposite. Furthermore, swelling behaviors of novel composites were evaluated. In our future work, we will aim to study the use of these nanocomposite as drug carrier.

Keywords: Halloysite, Zwitterionic Hydrogel

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SYNTHESIS AND CHARACTERIZATION OF NANO-ZNO/ FILLED POLYMER COMPOSITE AND EXPLORING THE SWELLING PROPERTIES

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Abstract:

Novel PDMAEMA (poly(2-(Dimethylamino)ethyl metacrylate) hydrogel composite filled with nano-ZnO was prepared in the presence of a crosslinking agent. The structure of nano-ZnO filled polymer composite was approved using a ATR-TIR spectrophotometer. Swelling behavior of polymer composite was studied as a function of time and pH. It was observed that nano-ZnO filled composite has high swelling ability in the aqueous medium. Furthermore, it was investigated that the swelling ratio of PDMAEMA / nano-ZnO composite was strongly dependent on the pH of the medium. The swelling ratio reached its maximum level at low pH while it decreased gradually above pH 6. This event can be explained as that at low pH the tertiary amine residues of the PDMAEMA chains remain protonated and therefore increased water binding capacity. On the other hand, as the solution pH increases above pH 6, deprotonation occurs rapidly resulting in decreased swelling ratio. In the next future, we aim to study its ability as an adsorbent for removal of textile dyes from water.

Keywords: Nano-Zno, Composite, Swelling

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BROWN-ROBINSON METHOD FOR MATRIX GAMES WITH FUZZY PAYOFFS

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Abstract:

In this work, a new geometric method for ordering generalized trapezoidal fuzzy numbers with different left and right heights is presented. We show that the proposed method can overcome the drawbacks of certain well-known ordering and ranking methods. The advantages of the proposed method are presented with comparative examples. We also have adapted Brown Robinson method to fuzzy matrix game whose entries are generalized trapezoidal fuzzy numbers with different left and right heights. It is shown that by means of this method, the value of fuzzy matrix game can be easily calculated. Although, the method is no way as useful as linear programming for calculating the solution of the game exactly, Brown Robinson method can be easily programmed by novice programmers. In addition, linear programming methods are not efficient enough for high dimensional fuzzy matrix games, but Brown Robinson method can be used even if the dimension of payoff matrix is too high.

Keywords: Generalized Fuzzy Numbers, Ordering Fuzzy Numbers, Fuzzy Matrix Games

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NUMERICAL SIMULATION OF HEAT EXCHANGER FOR JATROPHA OIL BIODIESEL FUEL PRE-HEATING

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Abstract:

Along with the increase in the number of vehicles in the world, the fuel requirement has also increased. Increasing demand for fossil-based fuels has begun to reduce fuel reserves and fuel prices have begun to increase. For this reason, the search for alternative fuels has accelerated. The most commonly used alternative fuels are biodiesel fuels because they are both less costly and less harmful to the environment than fossil fuels. Biodiesel fuels have a great contribution to the prevention of environmental pollution and to the economy. And biodiesel fuels are easy to transport and store because of the high flash points. In addition to the positive effects of biodiesel, it also has disadvantages such as having high viscosity, causing problems on cold days, and causing blockages in fuel filters.

In the work done, it is aimed to reduce the viscosity of Jatropha oil by applying pre-heating with the energy of exhaust gases using heat exchanger. Heat exchanger was analyzed numerically by using commercial computational fluid dynamics(CFD) code. The exit temperatures of Jatropha oil biodiesel are calculated for four different exhaust gas inlet temperatures. Flow was considered to be turbulent since the Reynolds number was greater than 2300. Realizable k-ε turbulence model and SIMPLE algorithm were used for simulations. The effects of inlet temperature of exhaust gases on the outlet temperature of the biodiesel were investigated. As a result, it has been observed that the exhaust gas entering the heat exchanger at 375 ° C heats the Jatropha oil biodiesel to approximately 140 ° C. This temperature ensures that the viscosity of Jatropha oil biodiesel decreases from 37 cSt to 2.57 cSt which is the same order of diesel fuel. The results are presented in terms of contours of velocity and temperature.

Keywords: CFD, Heat Exchanger, Jatropha Oil Biodiesel, Pre-Heating.

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INFLUENCE OF ETHANOL AND METHANOL ADDITIVES ON A DIESEL ENGINE PERFORMANCE CHARACTERISTICS: 1-D MODELLING

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Abstract:

There are many studies in the literature about the use of alternative fuels in internal combustion engine investigations. Particularly, fuel blends mixed with alcohol content have been found to have positive effects on exhaust emission values. In addition to this positive effect, it is necessary to examine how badly the engine performance character is affected. In this framework, 1-D modeling approaches have become a useful tool to get a fast and reliable solution. Ethanol and methanol fuel additives are known oxygenated fuels where extra oxygen content exist in the chemical formula. In this study, four cylinder diesel engine was analyzed by using 1-D modelling. AVL Boost commercial software was conducted to simulate engine cycles. Engine was run at full load with various engine speeds. Pure diesel and blended fuels was used to investigate the effects of additive ratios on the engine performance characteristics. Ethanol and methanol were chosen as fuel blend additives. Ethanol and methanol additives were set to different volumetric mixtures. Engine performance characteristics such as torque, brake power, brake thermal efficiency and specific fuel consumption etc., were analyzed comparatively. In addition, in-cylinder flow and combustion process were carried out at the best performance point where the engine speed reaches the engine torque gets maximum value. Obtained results show that, engine performance reduces by using alcohol additives for whole numerical predictions. It is seen that the engine torque is about 132 Nm value at the engine speed of 2000 rpm for pure diesel usage as a fuel. Both, 5% ethanol and methanol fuel blends torque values are 130 and 129 Nm respectively at the same engine speed. It is understood that the mixture ratio of %5 ethanol and methanol additives are the nearest fuel blend to the pure diesel performance results. Other performance characteristics such as BSFC, BP, Pin-cyl, Texhaust etc. were discussed in the result section.

Keywords: Ethanol And Methanol Additive, AVL Boost, Diesel Engine, Performance Characteristics.

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MICROSTRUCTURAL ANALYSIS OF 6224 SHEET PLATE WELDING SEAMED WITH COLD METAL TRANSFER

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Abstract:

Today, welding methods that are used in the manufacture of machines and working parts are frequently used. Control of the heat affected zone (HAZ) in welded joints is one of the most important issues. In welding applications, it is very important to keep this region narrow so that the welding seams do not break against mechanical forces. Some of the methods that provide narrow welding are; beam welding methods, tungsten inert gas (TIG), cold metal transfer (CMT) and solid state welding methods.

In the manufacturing industry, the CMT welding method is often used. CMT welding method developed by Fronius using the technology on gas welding method is used in many industries such as automobile industry, defense industry and power plants. According to the results obtained by the applied welding methods in the literature reviews, the HAZ width was found to be a big problem as a result of the mechanical and microstructure analyzes of the weld seam.

In this study, MIG / MAG and CMT welds were made in the dimensions of 200x100 mm in thickness of 2.5 mm and as sheet welded material 6224. The strength values of the welded joints obtained and the heat input were measured. In the samples, weld seam and HAZ analyzes were made at the macro and micro dimensions as a result of welding operations. The results were compared with each other and a narrower HAZ was obtained from welding made by the CMT method.

Keywords: 6224 Sheet Plate, Cmt Method, Welding Seam Analysis

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MICROSTRUCTURE PROPERTIES OF E360/AISI 420 STAINLESS STEEL JOINT BY FRICTION WELDING

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Abstract:

Nowadays, a variety of conventional joining technologies, are frequently used in many industrial applications such as fusion welding, and solid state welding. Friction welding process is widely used in automotive, manufacturing and space industries. This method is described by low heat input which is generated by transformation of mechanical energy into thermal energy at the joint interface due to rotation under pressure. Suitable for the welding of cylindrical materials particularly. Metallic materials with the same or different properties can be successfully joined by friction welding. In this study, E360-AISI 420 materials were combined with each other by a friction welding method. The experimental study was conducted with the welding parameters such as friction pressure and friction time. The metallurgical properties of friction-welded joints were determined. The changes in microstructure were also investigated. The experimental results indicated that E360 structural steel could be joined to AISI 420 stainless steel using friction welding technique and microstructural properties are significantly affected by changing welding parameters within the chosen range of conditions.

Keywords: Friction Welding, AISI 420 Stainless Steel, E360 Structural Steel

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LANDSCAPE PLANNING ON HIGHWAY DESIGN IN BILECIK HISTORICAL PLACES

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Abstract:

The negative affects of technology that grows rapidly is emerging that's irresponsible consumption of natural resources and in the form of pollution or degradation of nature. In this study we focussed landscpe planning about highway design parameters in Bilecik historical places. Bilecik is the little province, situated amid mountains and known more so for its winding roads, is where Turkey's legendary history first started. The birth place of Osman Ghazi, the founder of the Ottoman Empire, Sogut district, is also the first capital of the empire. Although Bilecik has largely drawn visitors as the first fortress conquered by the empire, with Shaykh Edebali's mausoleum, mosques, memories from the Ottoman history through to Turkey's War of Independence, the quaint midwest province also has much to offer tourists with its myriad of natural treasures. For this reason a new highway plan pass through without disturbing the landscape, in harmony with historical places, can respond to the needs of modern traffic and tourism must be in order. After the highway opened to traffic, highway landscape, but with the route selection process should be addressed. In this reason construction of highways, the landscape is considered to be an important element of the visual and environmental values in terms of taking into account the driver must be provided. Moreover, highway and slope planting work (type selection and planting method) to the principles of landscape planning should be exercised. As a result of this study, we examined studies conducted in highway landscape design in historical places and there have been proposed about these designs for historical places in Bilecik.

Keywords: Landscape Planning, Highway Plan, Bilecik Historical Places

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INFLUENCE OF THE COARSE AGGREGATES ON THE DEVELOPMENT OF THE MECHANICAL PROPERTIES OF CONCRETE PAVEMENT DESIGN

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Abstract:

Aggregate types have gained a special concern behind the latest earthquakes in Turkey. In this study, influence of the coarse aggregates on the development of the mechanical properties of the concrete pavement design was investigated. For this purpose, lightweight, natural river aggregate and crushed gravel aggregate as coarse aggregate, fly ash and silica fume as mineral admixtures were used while natural river sand was used in all mixes. Normal Portland Cement (CEM I 42.5 N) was used and its dosage was chosen as 360 kg/m3 which is between the normal dosage to produce concrete pavement design. Fly ash and silica fume was replaced with Portland cement by weight 30 % and 10 % respectively. Splitting tensile and compressive strength, ultrasonic tests of concrete specimens that were prepared at 3, 7, 14 and 28 days were determined in concrete pavement specifications. The result of the study, the highest and the lowest performances were obtained in the series of concrete pavement specimens prepared by crushed gravel and lightweight aggregates, respectively. The silica fume used as mineral admixture increased the strength of concrete pavement specimens that prepared using different aggregates. Silica fume concrete pavement specimens increased 16%, 13%, 8% in 28 days cube compressive strength of concrete as approximately that was prepared using, crushed gravel, natural aggregate and lightweight aggregate respectively.

Keywords: Concrete Pavement Design, Mechanical Properties, Coarse Aggregate, Fly Ash, Silica Fume

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AN INVESTIGATION INTO THE STABILITY OF SLOPES AND STOCKPILES AT AN OPEN CAST COAL MINE IN WESTERN PART OF TURKEY

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Abstract:

Since 1970s, lignite has been widely produced in Tuncbilek basin (Kutahya-Turkey) by Turkish National Coal Board (TCB). In addition to underground mining at few locations, open-cast mining technique has been much more preferred in this site. The lignite bearing sequences are found within the geological units composed of thinly bedded, stratified and fractured rock masses. Therefore, many geotechnical problems, particularly slope instabilities were observed in various dimensions at this basin due to rather weak geotechnical characteristics of these rock masses. Considering these problems, a research program providing required geotechnical parameters of rock masses to assess the stability of slopes and stockpiles was carried out at Tuncbilek open-cast coal mining site. The geological units in the Tuncbilek basin generally consist of clay-bearing rocks such as claystone, mudstone, marl etc., as well as thinly bedded limestone layers.

In this study, field measurements, rock mass classification systems, empirical failure criteria and the results predicted from back analysis were used in the accurate determination of shear strength parameters for the rock masses and stockpiles. As a result of the analysis, the cohesion and internal friction angle of clay-bearing rock masses were determined as 200 kPa and 30□, respectively. However, a cohesion of 150 kPa and an internal friction angle of 25□ are considered to be more representative for disturbed clay-bearing rock masses. The cohesion and internal friction angle of stockpiles were identified as 20.5 kPa and 32.3□, respectively. Slope stability analysis by the limit equilibrium method reveal that the overall slope angles ranging between 30□ and 32□ should be used for the open-cast excavation in clay-bearing rock masses. Furthermore, it can be concluded that the overburden materials can safely be stockpiled at an overall slope angle of 20□ with a geometry of 40 m., 30m., 36□, for bench width, bench height and angle, respectively.

Keywords: Open Cast Mining, Slope Stability, Stockpile, Weak Rock

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APPLICATION OF BOX-BEHNKEN EXPERIMENTAL DESIGN ON RESISTANCE SPOT WELDING OF DKP STEEL

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Abstract:

Resistance Spot Welding (RSW) is used frequently in automotive industry since it is inexpensive, easy automated and capable of producing high quality joints. The process is based on the contact resistance between the metals to be joined and the electrodes. During the process, a weld nugged is formed due to melting at interface as the temperature increases due to the electrical resistance of materials. This study investigates the effects of time, pressure and current parameters on tensile strength of 1 mm thickness DKP sheet welded by RSW. Experiments are designed according to the Box-Behnken experimental design that is one of the most widely used response surface method (RSM) in order to obtain more information by making less number of experiments. In addition, by applying Box-Behnken method, it is possible to investigate the parameter's main effects, their interactions and their sequential order on the tensile strength. It was found that the current parameter is the most effective parameter on tensile strength and time is the second important individual parameter. First order effect of pressure was found statistically insignificant however, quadratic effects of three parameters were determined as statistically significant at 95% significance level. According to the interaction effect analysis, interactions between parameters has no effect on the tensile strength and therefore, their interactions can be ignored.

A second order mathematical model that can be used for the estimation of tensile strength as a function of time, pressure and current parameters, with a determination coefficient (R2) of 0.9677 was obtained. This model can explain about 97% of the variance. The model was statistically significant at 95% significance level and lack of fit was not significant. Actual versus predicted tensile strength values determined by the model were good agreement.

Keywords: Design Of Experiments, Response Surface Method, Box-Behnken Design, Resistance Spot Welding, DKP Steel

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CENTRAL COMPOSITE DESIGN FOR WASTEWATER TREATMENT BY FLOC-FLOTATION IN JAMESON CELL

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Abstract:

Removal of very fine particles from wastewater is difficult especially in lower solid concentrations since their settling rates take much longer time. In order to increase the precipitation rate of fine particles, particles are aggregated with high molecular weight flocculants and enlarged particles are removed easily from wastewaters. During this process, it is very important to select most suitable flocculant for relevant particles. It is desired that particles are settled in a short time and supernatant turbidity should be clear enough to be re-use. Flocculation combined with flotation, called floc-flotation, is getting attention in recent years due to its advantages over other methods.

In this paper, Jameson cell which is a type of induced air flotation device was applied for the treatment of fine quartz solutions containing -20 micron sized particles and low solid concentrations (0.06% solid ratio). Effects of feed flow rate, flotation time and condition time parameters were investigated on the removal of quartz particles flocculated by anionic flocculant and supernatant turbidities of quartz solutions were measured after each experiments. The experiments were planned according to a three parameter five level Central Composite Design (CCD) which is a type of Response Surface Method. According to CCD evaluation results, flotation time was the most significant parameter, its first and second order effect were found important at 95% significance level. First order of feed flowrate and second order of condition time were determined as significant parameters at 95% confidence level. In addition, interactions between feed flow rate and flotation time and also flotation time and condition time were significant on the supernatant turbidity.

A second order mathematical model that can be used for predicting residual turbidity after floc-flotation was obtained by CCD design results. The model can explain about 96.27% of residual turbidity variance changes by the tested parameters.

Keywords: Design Of Experiments, Central Composite Design, Flocculation, Flotation, Jameson Cell

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ABSORPTION OF UREA BY NOVEL BIOCOMPATIBLE HYDROGEL (P(DMAAM-CO-AGAR))

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Abstract:

Water conservation is an important step to achieving sustainable growth and development in agriculture. Recently, superabsorbent materials such as hydrophilic polymers have gained much attention as they can increase plant growth through water and fertilizer retention properties [1-2]. In this investigation p(DMAAm-co-Agar) hydrogel was synthesized using N, N-Dimethylacrylamide (DMAAm), Agar as monomers for targeted nitrogenous fertilizer absorption. Synthesized p(DMAAm-co-Agar) hydrogel was investigated swelling behaviors in deionize water and sensibility pH and was characterized using Fourier Transform Infrared Spectroscopy (FT-IR) and Thermal Gravimetric Analysis (TGA). In the environmental applications of p(DMAAm-co-Agar) hydrogel aimed removal from aqueous medium of urea fertilizer. Therefore, in this study investigated effect on the absorption performance of initial fertilizer concentration (mg/L), the pH of the media, and temperature (°C). Ultra-Viole spectroscopy was used to quantify urea fertilizer during absorption studies. The most utilized absorption isotherms models like Langmuir and Freundlich were studied to obtain the best-fitted isotherms equation. Moreover, thermodynamic parameters were evaluated. Under specified experimental conditions, the maximum absorption capacity for urea fertilizer was calculated to be approximately 89.15 mg/g.

Keywords: N, N-Dimethylacrylamide, Agar, Urea, Hydrogel

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ENVIRONMENTALLY FRIENDLY BIOCOMPATIBLE HYDROGELS FOR WATER CONSERVATION AND UREA ABSORPTION IN AGRICULTURAL LANDS

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Abstract:

Nitrogen is the vital nutrition for plant growth, and the inadequacy of nitrogen has been considered that the limiting factor for plant growth. From an economic point of view, urea is one of the most important commercially available nitrogenous fertilizers and has high nitrogen content. In this investigation p(DMAAm-co-MA)-NaOH hydrogel was synthesized using N,N-Dimethylacrylamide (DMAAm), Maleic acid (MA) as monomers and was modified by sodium hydroxide (NaOH) for targeted urea absorption. Synthesized p(DMAAm-co-MA)-NaOH hydrogel was investigated swelling behaviors in deionize water and sensibility pH and was characterized using Fourier Transform Infrared Spectroscopy (FT-IR) and Thermal Gravimetric Analysis (TGA). In the environmental applications of p(DMAAm-co-MA)-NaOH hydrogel aimed removal from aqueous medium of urea fertilizer. Therefore, in this study investigated effect on the absorption performance of initial fertilizer concentration (mg/L), the pH of the media, and temperature (°C). Ultra-Viole spectroscopy was used to quantify urea fertilizer during absorption studies. The most utilized absorption isotherms models like Langmuir and Freundlich were studied to obtain the best-fitted isotherms equation. Moreover, thermodynamic parameters were evaluated. Under specified experimental conditions, the maximum absorption capacity for urea fertilizer was calculated to be approximately 116.07 mg/g.

Keywords: Absorption, Hydrogel, Nitrogen Fertilizer.

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SYNTHESIS, CHARACTERIZATION AND AGRICULTURAL APPLICATION OF MODIFIED P(DMAAM-CO-AGAR)-HCL BIOCOMPATIBLE HYDROGEL

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Abstract:

In recent years, to meet requirement as foods and other agro-products, at great amounts the varied fertilizers such as nitrogen, phosphorous, and potassium have been directly applied to improve crop yields. Direct use of fertilizers is greatly reduced the efficiency due to the volatilization. In the recent years, chemically synthesized polymeric hydrogels with functional groups such as -OH, -COOH, -NH2, -CONH2 and SO3H were utilized in many absorption studies and agricultural applications. In this investigation p(DMAAm-co-Agar)-HCl biocompatible hydrogel was synthesized using N,N-Dimethylacrylamide (DMAAm), Agar as monomers and was modified by hydrochloric acid (HCl) for targeted urea absorption. Synthesized p(DMAAm-co-Agar)-HCl biocompatible hydrogel was investigated swelling behaviors in deionize water and sensibility pH and was characterized using Fourier Transform Infrared Spectroscopy (FT-IR) and Thermal Gravimetric Analysis (TGA). In the environmental applications of p(DMAAm-co-Agar)-HCl biocompatible hydrogel aimed removal from aqueous medium of urea fertilizer. Therefore, in this study investigated effect on the absorption performance of initial fertilizer concentration (mg/L), the pH of the media, and temperature (°C). Ultra-Viole spectroscopy was used to quantify urea fertilizer during absorption studies. The most utilized absorption isotherms models like Langmuir and Freundlich were studied to obtain the best-fitted isotherms equation. Moreover, thermodynamic parameters were evaluated. Under specified experimental conditions, the maximum absorption capacity for urea fertilizer was calculated to be approximately 99.54 mg/g.

Keywords: N,N-Dimethylacrylamide, Agar, Biocompatible Hydrogel, Modification, Urea

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THE PREPARATION OF MODIFIED BIOCOMPATIBLE HYDROGEL FOR UREA FERTILIZER RECOVERY FROM AQUEOUS ENVIRONMENTS

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Abstract:

The absorption and release of fertilizers from aqueous solutions is one of the most important issues to increase crop yields. Therefore, in the recent years, natural and synthetic biopolymers are being used as alternative coating materials for improving the absorption and release performance of slow-release fertilizers. In this investigation p(DMAAm-co-MA)-HCl hydrogel was synthesized using N,N-Dimethylacrylamide (DMAAm), Maleic acid (MA) as monomers and was modified by hydrochloric acid (HCl) for targeted urea absorption. Synthesized p(DMAAm-co-MA)-HCl hydrogel was investigated swelling behaviors in deionize water and sensibility pH and was characterized using Fourier Transform Infrared Spectroscopy (FT-IR) and Thermal Gravimetric Analysis (TGA). In the environmental applications of p(DMAAm-co-MA)-HCl hydrogel aimed removal from aqueous medium of urea fertilizer. Therefore, in this study investigated effect on the absorption performance of initial fertilizer concentration (mg/L), the pH of the media, and temperature (°C). Ultra-Viole spectroscopy was used to quantify urea fertilizer during absorption studies. The most utilized absorption isotherms models like Langmuir and Freundlich were studied to obtain the best-fitted isotherms equation. Moreover, thermodynamic parameters were evaluated. Under specified experimental conditions, the maximum absorption capacity for urea fertilizer was calculated to be approximately 135.94 mg/g.

Keywords: Fertilizer, Hydrogel, Absorption.

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TURKISH CONSTRUCTION FIRMS' PERCEPTIONS OF RECYCLED MATERIALS

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Abstract:

Waste materials are one of the most significant problems that the construction industry faces because of their harmful effects on the natural and built environment. To solve this problem, construction firms should implement a proper waste management strategy. In doing this, there are three main measures such as reducing, reusing, and recycling. In many developing countries, the first two methods are usually employed in order to deal with waste construction materials. However, the third one (that is, recycling) is skipped in general as it requires a costly and time-consuming process, environmental awareness, and technical standards. Therefore, this study aims to reveal the perspective of construction firms about recycled materials that can be used in the construction industry in a developing country, Turkey. To achieve this objective, a questionnaire survey was conducted with 66 construction companies in Turkey. The results were evaluated through a statistical analysis of questions with 5-point Likert-type scale. Consequently, Turkish construction firms' perceptions of recycled materials were determined in a detailed manner. In addition, recommendations were made given the dissemination of the use of recycled construction materials for a sustainable industry.

Keywords: Construction Industry, Recycled Materials, Recycling, Sustainable Construction, Turkey

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CONSTRUCTION AND DEMOLITION WASTE RECYCLING PLANTS IN TURKEY

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Abstract:

Wastes generated in the process of construction, renovation, and demolition of buildings and structures are described as construction and demolition waste (C&DW). In many countries, C&DW is regarded as one of the major issues that threatens the environment and its embedded raw materials. In order to overcome this problem, there are three basic options such as reducing, reusing, and recycling. Considering construction projects executed in many developing countries, the first two options are usually and initially employed to reduce the amount of C&DW. However, the option "recycling" is generally neglected. This is because it needs a relatively high initial investment cost, extra sensitivity for environmental protection, and detailed regulations concerning material compositions. Therefore, the objective of the current study is to identify and examine technical features and operational capabilities of the existing C&DW recycling plants in Turkey as a developing country. For this purpose, a questionnaire survey was applied to facility managers of C&DW recycling plants operating in three different cities (i.e., Istanbul, Eskisehir, and Mugla) in Turkey. As a result, the current situation and the future perspective of C&DW recycling plants in Turkey were evaluated extensively. Moreover, the economic performance of these plants was also discussed in detail.

Keywords: C&DW, Recycled Materials, Recycling Plants, Turkey, Waste Management

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THE PROPERTIES OF IMMOBILIZED INVERTASE ONTO A NOVEL POLY (METHACRYLAMIDE) / SEPIOLITE COMPOSITE HYDROGEL

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Abstract:

The current demands of the world's biotechnological industries are enhancement in enzyme productivity and development of novel techniques for increasing their shelf life. Enzyme immobilization provides an excellent base for increasing availability of enzyme. Several natural and synthetic supports have been assessed for their efficiency for enzyme immobilization. In this study, preparation and characterization of a novel poly(methacrylamide)/sepiolite composite hydrogel (PM/S) for immobilization of invertase (β-fructofuranosidase; E.C.3.2.1.26) which is important enzyme for food industry was aimed.

Homopolymeric hydrogel poly(methacrylamide); PM and composite hydrogel poly(methacrylamide)/ sepiolite; PM/S were prepared by free radical crosslinking reaction. The results of thermal analysis show that hydrogels have great thermal stability. Swelling of the hydrogel in distilled water reduced with the addition of sepiolite. Diffusion of water within hydrogel was found to be non-Fickian in character.

Invertase was immobilized onto PM and PM/S so immobilized invertases PM-I and PM/S-I were prepared. Optimum pH values were found to be; 6.0, 4.0 and 3.0 for free invertase (I), PM-I and PM/S-I respectively. Optimum temperatures were found to be; 30 °C, 30 °C and 50 °C for I, PM-I and PM/S-I respectively. It was found as Km: 7,17 mM, Vmax: 1,68 µmol min-1 for I, Km: 35,25 mM, Vmax: 3,64 µmol min-1 for PM-I and Km: 71,41 mM, Vmax: 7,84 µmol min-1 for PM/S-I. The invertase immobilized hydrogels showed excellent thermal, pH, storage, and operational stability. These results showed that poly(methacrylamide)/sepiolite composite hydrogel is suitable support for immobilization of invertase.

Keywords: Immobilization, Invertase, Hydrogel, Methacrylamide, Sepiolite

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NEW TRENDS IN FOOD TECHNOLOGY: NANO FOODS

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Abstract:

Nanotechnology can be used to enhance food flavor and texture, to reduce fat content, or to encapsulate nutrients, such as vitamins, to ensure they do not degrade during a product's shelf life. The food processing industry must ensure consumer confidence and acceptance of nanofoods.

The term 'nanofood' describes food that has been cultivated, produced, processed or packaged using nanotechnology techniques or tools, or to which manufactured nanomaterials have been added. The benefits of nanofood, for instance, include health-promoting additives, longer shelf-lives or new flavor varieties. Nano food packaging materials may extend food life, improve food safety, alert consumers that food is contaminated or spoiled, repair tears in packaging, and even release preservatives to extend the life of the food in the package. A list of food products currently containing nanoproducts include: Canola Active Oil (Israel), Nanotea (China), Fortified Fruit Juice, Nanoceuticals Slim Shake, NanoSlim beverage, Oat Nutritional Drink, and 'Daily Vitamin Boost' fortified fruit juice (USA) and nanocapsules containing tuna fish oil (a source of omega 3 fatty acids) in "Tip-Top" Up bread (Australia). Especially the nano pizza, which is one of the first examples of the product which is offered for sale in USA. When the pizza is heated at 100 degrees, the color is red, but it also evokes the tomato in terms of taste. But when the same pizza is heated at 200 degrees, the color turns green and the taste begins to give the taste of spinach. Another example is Mentos candies. The natural nanotubes and nanotubes contained within the mentos sugars have flavors hidden in them. As you sugar melt in your mouth, nanotubes continue to explode and you are constantly getting a fresh, fresh aroma. The chocolates developed with this technology can be made resistant to the desired level.

It is widely expected that Nanotechnology-derived food products will be available increasingly to consumers worldwide in the coming years.

Keywords: Nanotechnology, Nanofood, Food Packaging, Nanoparticles

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THERAPEUTIC EFFECT OF CAMEL MILK

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Abstract:

Camel's milk is generally an opaque white color and has a faint sweetish odor and sharp taste; sometimes it can be salty. It is becoming popular due to its claimed therapeutic property and contains low cholesterol, low sugar, high minerals (sodium, potassium, iron, copper, zinc, and magnesium), high vitamin C, protective proteins. Health benefit potentials of camel milk are obtained through a number of bioactive components in camel milk. Camel milk is enriched with various protective proteins like lysozyme, lactoferrin, lactoperoxidase, NAGase, PGRP, IgG and IgA which exert antibacterial, antiviral, antifungal and antiphrastic activity, immunological properties, growth promotion activity and anti-tumor activity. protective proteins and their immunological action in camel milk have therapeutic effects. Camel milk have been acknowledged for a long time in different parts of the world to provide a potential treatment for a series of diseases such as dropsy, jaundice, tuberculosis, asthma, and leishmaniasis or kala-azar. Several studies from many parts of the world have confirmed the medicinal properties of camel milk. It helps in the treatment of many ailments such as food allergy, ulcer, jaundice, arthritis, diarrhea, flatulence, hepatitis, gastritis, diabetes, autism, malaria, constipation, HIV, paratuberculosis, fever, rickets, anaemia, asthma, cancer, tuberculosis, leishmaniasis, malaria, blood pressure, cardiac problems, dropsy, erectile dysfunction, dermatitis, dandruff, acne, eczema, psoriasis, and wrinkles besides, it can detoxify snake venom. It is suggested that camel milk can be used as an alternative for individuals who are intolerant to lactose of cow's milk. Camel milk has antioxidant properties as a consequence of its high vitamin C contents which helps to control tissue damage.

The value of camel milk has increased worldwide because of its high therapeutic properties for human health.

Keywords: Camel Milk, Properties, Health Benefit, Valeu Of Camel Milk

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INVESTIGATION OF NOTCH ROOT STRAIN BEHAVIORS UNDER COMBINED LOADINGS

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Abstract:

Notches are the stress raiser regions. Along the notch section, not only the stress distrubiton becomes non-uniform, but also the stress level reaches the maximum value. These geometrical disorders can be undesirable such as casting cavity but sometimes these disorders are created deliberately for assembly process such as keyway holes or shaft steps. Because of the necessity of these notchs, This is important to understand material behavior along this region.

In this study, three different strain paths will be created by the cyclic tensile and torsial loadings and strains of the notch root of a shaft which has circumferentially notch will be investigated through the finite element method (FEM). MSC. Marc commercial program will be used in this study as finite element analysis software. The results will be obtained for kinematic hardening rules and compared with the experimental results. Also in this study, a subroutine file will be used to calculate the Chaboche kinematic hardening parameters according to Swift equation.

Keywords: Cyclic Plasticity, Kinematic Hardening, Finite Element Analysis, Non-Proportional Loadings

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DATA MINING ON GLOBAL TERRORISM ATTACKS BETWEEN THE YEARS OF 1970 AND 2016

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Abstract:

Globalizing, marketing and research methods reveal the importance of information when compared to data. With the development of the technology, the number of data increases and makes it more difficult to reach the correct information. In this case, data mining emerges as a vital solution. Data mining is a collection of improved methods for making large data stack contents usable for the owner of these data stacks. All of the data is examined and valuable, useful and worthwhile of them are chosen to be utilized for different aims. Mostly, these huge amounts of gathered data are scrutinized for defining their unexpected / unknown relationships among them to provide understandable data. Today, data mining is one of the most popular research topics because it is based on mathematics. Data mining is utilized in space, marketing, computing and many different areas. In the project, data analysis was implemented on the dataset of Global Terrorism DataBase (GTD) (http://www.start.umd.edu/gtd/) for data mining. R language was used for providing data mining and it is utilized to find rational and convenient data among enormous data stacks.With R language, gathered available data can be easily analyzed as statistically. In the project, terrorism rates' distribution was determined according to the countries. Then, frequencies and types of the terrorism rates' according to the years were found. With utilizing linear regression, the relationship between the weapon type and death number was examined. With the help of the decision tree learning, according to the accomplished/ unaccomplished attacks and death/wounded number of people, a frequency table was presented for each year.

Between the years of 1970 and 2016, Global Terrorism attacks were examined in the project according to the countries, weapon types, frequency of attacks, and years to be able to attract attention to the increasing rates of Global Terrorism in the world.

Keywords: Data Mining, R Language, Linear Regression, Decision Tree Learning

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BUY & SELL E-COMMERCE WEB APPLICATION

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Abstract:

Basicly, the project aims to build a structure in which users can sell or buy new or used products in different categories. In addition to this, the project provides location based shopping, communication between users, adding product comments and scores for each product. The users should login to use the application. Then, they can manage their products, observe their order status, receive messages immediately about the products offered for sale and shop in the application. Also, users will be graded according to his/her purchase and sales rates. These rates will provide reliability for the users.

By the effect of improving technology, online shopping and e-commerce emerged and become very popular. The project's main aim is to present a web application for e-commerce to make life easier for people of all ages with its easy to use and user friendly interface. The project provides a communication platform for people to sell their various types of used/unused products.

MySQL was used as a data base and java programming language was utilized together with Angular2, HTML5, CSS ve Bootstrap technologies. MVC architecture was based on with Frontend ve Backend frameworks. Web service structure was used together with Angular2 instead of java web frameworks. Also, instead of JavaScript, TypeScript was utilized in frontend with object oriented approach.

Keywords: Online Shopping, E-Commerce, Web Application

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MODIFIED ACTIVATED SLUDGE SYSTEMS FOR HIGH ORGANIC LOADINGS

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Abstract:

In order to increase the reactor performance in the case of increased organic loading in activated sludge processes, the methods applied are to increase the reactor volume or MLVSS concentration of the reactors. However, it is not desirable that the MLVSS concentration is above 8000 mg / L in activated sludge systems. In this case, the concentration of microorganisms must be increased by different methods. In brush modified activated sludge systems, some of the active biomass can attach to a media with large surface area. These systems provide better aeration by rotation and extensively large biofilm surface area because of the brush structure.Thus, the performance of the reactor can be increased against increasing organic load without increasing the volume in the reactors. In this study, domestic wastewater treatment characteristics of microorganisms attached to 3 different medias were investigated. For this purpose, a reactor with three different surface materials (modified with a net, brush and sponge) and a control reactor were run parallel to each other for 52 days under MLVSS 3000±580 mg/L conditions. In the reactors HRT was maintained for 1 day and the influent COD concentration was 750 mg/L and the effluent dissolved COD concentration was measured to be 20±7, 13±7 and 18±11 mg/L respectively for the net, brush and sponge modified reactors. In the control reactor operated in operation, the effluent average COD concentration was 25±17 mg/L. In the second phase of the study, COD removal kinetic studies of attached microorganisms were performed and high COD removal performance was observed in reactor with extended surface area.

Keywords: Activated Sludge,Attached Growth,Cod Removal,Wastewater Treatment

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REDUCTION OF ACID BLUE 264 DYE USING H2S ELECTRON MEDIATOR: AN OPTIMIZATION STUDY

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Abstract:

Azo dyes are the most common dyes used in textile industry due to their ease and cost effectiveness, stability and variety of colors. Discharging of these dyes to the receiving media leads to deterioration of the water quality. There are several methods to remove or reduce azo dyes from industrial wastewaters which commonly occur under anaerobic conditions. In these decolorization, an electron donor particularly organic matter releases its electrons and some electron mediators carry the electrons to azo dye to form aromatic amines. Sulfide which forms by sulfate reduction under anaerobic conditions could be used as electron mediators in this reduction process. In this study, the reduction of Acid Blue 264 dye was investigated in a batch system by sulfur mediated reduction mechanism. Sulfide was produced in an up flow anaerobic sulfate reducing reactor to oxidize ethanol and to form H2S. The effluent of sulfate reducing reactor containing H2S, as an electron mediator, used to reduce azo dye in separate batch reactors. Considering maximum dye removal efficiencies, initial dye concentration, sulfide concentration and reaction time were optimized using Box-Behnken Statistical Design. The model coefficients were determined via multiple regression analysis and the model equation was solved to determine the optimum operating variables. R2 of 0.9554 shows that the model was statistically significant and model equation can be used to adequately describe the dye removal under a range of operating conditions. The optimal dye removal was determined as 86.04 % for 75 mg/L of initial dye concentration, 40 mg/L of H2S concentration and 30 minutes of reaction time. The results of this study revealed that H2S can be used as an electron mediator in order to remove dye and statistical design methodology was an efficient and feasible approach in determining the optimum conditions for dye removal.

Keywords: Azo Dye, Sulfate Reducing Reactor, H2S Electron Mediator, Box Behnken Statistical Design

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FINITE ELEMENTS ANALYSIS OF STEEL AND GLASS FIBER/EPOXY PRESSURE VESSELS

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Abstract:

Pressure vessels are produced from different materials such as metallic and composite. Each material has its advantages, as well as its weaknesses. Pressure vessels have many industrial or individual applications. Each usage area needs different requirements such as strength, lightness, refractoriness or cost. In this study, endurability against pressure of steel and glass fiber/epoxy pressure vessels that have different thicknesses was analyzed. The relation between thickness-mass-pressure is established. Pressure vessels were modeled with thicknesses of 2, 3, 4, 5, 6, 8 and 10 mm. The analysis was made with two different materials, steel and glass fiber-epoxy composites. The ply orientations in the composite models are designed as [+55°/-55°]s. The number of layers was taken as 3 layers for each 1 mm thickness. Maximum pressures were found for each material and thickness. The maximum pressures that the steel material can withstand are between 13.7 and 69.0 bars depending on the thickness. These values range from 7.0 to 31.2 bar for glass/epoxy composite. The models with a wall thickness of 2 to 10 mm have masses of 50 to 248 kg for steel and 17 to 86 kg for glass fiber. As a result, the model made from steel can withstand higher pressures for the same thickness. In addition, the production cost of the steel pressure vessel would be lower than that of the composite one. Both materials show the required strength at some pressure ranges. The choice of glass fiber/epoxy would be more appropriate when lightness is important for a vessel to operate at these pressures.

Keywords: Pressure Vessel, Steel, Composite, Finite Element Analysis

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ANALYSIS AND MANUFACTURING OF WOODEN CORE AND GLASS FIBER/EPOXY FACE SHEETS SANDWICH COMPOSITE ELECTRIC SKATEBOARD

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Abstract:

The materials used on the electric skateboard are usually wood-based. This makes the skateboard heavy and adversely affects its flexibility and carrying capacity. Another problem with electric skateboards is the range, which is short due to the limited battery capacity. The main purpose of this study is to use the superior properties of composite materials and to make the skateboards more durable and lighter. Thus, it is intended to have a longer range, to be used in transportation, to carry more and to have a longer life than existing electric skateboards. Also, with the use of wood as a core of the sandwich composite structure, the cost has been reduced by using less composite materials. Firstly, the material to be used was determined for skateboard manufacturing. It is considered to have glass fiber/epoxy face sheets and wooden core. This predicted sandwich structure was determined after a series of analysis steps. In these analyses, lightness, strength, and cost are kept in the foreground. The thickness of the wooden core was determined as 7 mm and the number of glass fiber layers was determined to be ten, as five on the bottom and five on the top. The sandwich composite structure is produced by vacuum assisted resin transfer molding (VARTM). Since the thickness of the wooden core might prevent the flow of epoxy during production, a successful production has been achieved and the problem of non-wetting of the fibers has not occurred. Electric motor, battery, and the other parts were assembled on the sandwich composite skateboard and tested. As a result, a skateboard that capable of withstanding a load of 100 kg, a lighter compared to wooden one and a cost-efficient compared to composite one was produced.

Keywords: Sandwich Composite, VARTM, Finite Element Analysis, Electric Skateboard

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RECOVERY OF SHIP WASTE EXHAUST GAS ENERGY BY TRANSCRITICAL ORGANIC RANKINE CYCLE

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Abstract:

Increasing fuel prices, global energy demand and the introduction of new restrictive emission regulations require more efficient and environmentally friendly power cycles to be designed and the best evaluation of available energy types. If considered that the vast majority of world trade have been carried by the ship transportation, energy efficiency is becoming important in maritime transport. The International Maritime Organization (IMO) is gradually imposing limitations on marine origin emissions. Waste heat sources in ships are main and auxiliary machinery. In this context, additional installations are necessary for the waste energy to be useful work. The main waste heat sources in a ship are: exhaust gas, cooling water, lubrication oil and sweeping air. One of the methods for energy recovery from these waste heat sources is Organic Rankine Cycle (ORC). ORC applications are seeing an increasing interest in renewable energy. These applications are especially used to convert low and medium thermal energy sources into useful works. Different configurations can be applied using organic fluid cycles. In this study, the Transcritical Rankine Cycle (TORC) that is a derivative of the Organic Rankine Cycle (ORC), examined for waste heat recovery because of higher efficiency than ORC.

Heat exchangers are naturally used in waste heat recovery. Thereby, heat transfer and pressure loss models are formed in this study. At the end of this work, parametric results will be compared with different organic work fluids, heat exchanger parameters and TORC installations.

Keywords: Transcritical Organic Rankine Cycle, Waste Heat Recovery, Energy Economy, Marine Engines.

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EVALUATION OF SUPERCRITICAL CARBON DIOXIDE (SCO2) BRAYTON POWER CYCLE WITH CATALYTIC COMBUSTION IN MARINE APPLICATIONS

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Abstract:

As it is widely known most of the thermal power cycles in commercial use are either air breathing direct fired open Brayton cycles like gas turbines or indirect fired closed Rankine cycles which use water as a working fluid. However, the Brayton cycle based on supercritical carbon dioxide (sCO2) as the working fluid is an innovative concept for converting thermal energy to electrical energy which is more efficient than other cycles. Commercialization of sCO2 Brayton cycle technology to the marine applications will depend on various financial, technical, regulatory, social and value chain factors. These must be properly understood and addressed before commercialization and maritime market risks are alleviated. Therefore, in this study, assessment of sCO2 power cycle in marine applications is considered. The potential applications have been introduced by taking market opportunities into account. The challenges of this technology and sub topics like oxy-fuel catalytic combustion have been explained. sCO2 power cycles are expected to have a very common use in the near future.

Keywords: Supercritical Carbon Dioxide, S-CO2 Brayton Cycle, Oxy-Fuel Catalytic Combustion, Marine Application.

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NITRATE REDUCTION IN AUTOTROPHIC AND HETEROTROPHIC PROCESSES

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Abstract:

Nitrate is one of the most common pollutants found in drinking water and its presence in the water causes a number of health problems, particularly methemoglobinemia known as blue baby syndrome. The mortality rate of newborn babies due to methemoglobinemia is thought to be 8-10%. In addition, cancers, tumors, gastric problems, hypertension and some acute health problems are some of the health problems caused by nitrate. Autotrophic and heterotrophic denitrification processes can be applied to remove nitrate from drinking water. Although heterotrophic denitrification is fast and efficient, it can cause microbial contamination in the water distribution networks in the case of organic matter residues in the effluent. These residual organic substances may also cause disinfection by-products. Alternatively, autotrophic processes use cleaner electron sources. Inorganic electron sources (FeO, S0 and H2) can be used in the biological reduction of nitrate. Hydrogen is highly effective and does not leave organic and inorganic residues, however, it is expensive and has explosive nature. Iron is inexpensive and easy to use, but its use is limited because its reaction rate is low. Elemental sulfur, however, has a serious advantage over other electron sources as an electron source that is slowly dissolving and does not require continuous additions. However, if the drinking water contains excessive nitrate concentration, undesirable sulfate can form in the effluent. As a conclusion the slow kinetics of inorganic electron sources (compared to organic electron sources) and the secondary pollution of some electron sources are the major disadvantages of the process. In this study, electron sources which are widely used in the denitrification process have been reviewed and their advantages and disadvantages have been revealed. In addition, mixotrophic processes that use both organic and inorganic electron donors are explained in terms of advantages and drawbacks.

Keywords: Autotrophic Denitrification, Heterotrophic Denitrification, Nitrate Reduction, Groundwater

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THE EFFECT OF SLUDGE AGE ON THE OPERATING PARAMETERS OF ACTIVATED SLUDGE SYSTEMS AND THE FATE OF DAILY PRODUCED SLUDGE

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Abstract:

Activated sludge systems are treatment units in which biodegradable solids in wastewater are removed. In these units, organic substances are consumed by microorganisms in the presence of oxygen, resulting in CO2 and new biomass as final products. The sludge age determines many operating parameters such as reactor volume, oxygen requirement of the system and excess sludge to be thrown daily. For example, for an activated sludge unit containing 450 mg/L biodegradable solid and 10000 m3/day flow rate, the reactor volume for the sludge age 2 and 23 were calculated to be 1237 and 7730 m3, respectively. Similarly, the oxygen requirement of the system can be 2118 and 3295 kg O2/day for the same sludge ages. The amount of daily sludge disposed from the system decreases with increasing sludge age. This reduces daily sludge disposal costs, resulting in more active biomass accumulation in the system (aged sludge), which determines the amount of air to be supplied into the reactor. As a result, it causes an increase in the aeration costs. In this study the costs of sludge disposal and the areation costs of the reactors at different sludge ages were compared. In addition, the anaerobic digestion scenario of the daily amount of sludge in the different sludge age was evaluated. While sludge age 2 has 1240 m3/day methane and 3597 kWh/day electric energy potential, for sludge age 23 it was calculated as 362 m3/day methane and 1051 kWh/day electric energy potential. For this purpose, biogas potential and electricity energy equivalent of the daily sludge amount are theoretically calculated for each sludge age value. The results show that for both scenarios the sludge age should be selected at the smallest possible value.

Keywords: Sludge Age, Activated Sludge, Excess Sludge, Anaerobic Sludge Treatment

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CYTOTOXIC AND GENOTOXIC EFFECT OF CERIUM(IV) OXIDE BY ALLIUM AND COMET ASSAY

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Abstract:

Cerium oxide (CeO2) is widely used in a variety of applications such as glass/ceramic polishing agent, television tubes, solar cells, fuel cells, ultraviolet absorbents, and gas sensor. In this study, genotoxic effects of CeO2 nanoparticles (CeO2 NPs, <25 nm) and their microparticles (MPs, < 5 µm bulk) were investigated by using mitotic index (MI), mitotic phases, chromosomal abnormalities (CAs) and DNA damage on the root meristem cells of Allium cepa by employing both Allium anaphase-telophase and Comet assays. A cepa roots were treated with the aqueous dispersions of CeO2's at 4 different concentrations (12.5, 25, 50, and 100 ppm) for 4 h. Distilled water and methyl methane sulphonate (MMS,10 ppm) were used as negative and positive control groups, respectively. All the applied doses statistically decreased MIs. CeO2's significiantly increased CAs such as disturbed anaphase-telophase, chromosome laggards, stickiness and bridges and also DNA damage. These results demonstrate that CeO2 has cytotoxic and genotoxic effects in A. cepa root meristematic cells.

Keywords: Allium, Comet, DNA Damage, Cerium (IV) Oxide

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GENOTOXIC EFFECT OF TUNGSTEN (VI) OXIDE NANOPOWDER IN ALLIUM CEPA ROOT MERISTEMATIC CELLS

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Abstract:

Tungsten (VI) oxide particles (WO3) is widely used in a variety of applications such as production of electro chromic windows, or smart windows, x-ray screen phosphors and gas sensors and a pigment in ceramics and paints. In this study, genotoxic effects of WO3 nanopowder (WO3 NPs, <100 nm) were investigated on the root meristematic cells of Allium cepa by employing both Allium anaphase-telophase and Comet assays. A. cepa roots were treated with the aqueous dispersions of WO3 NPs at 5 different concentrations (12.5, 25, 50, 75, and 100 ppm) for 4 h. Distilled water and methyl methane sulphonate (MMS,10 ppm) were used as negative and positive control groups, respectively. While exposure of WO3 NPs significantly decreased mitotic index (MI), they significantly increased the chromosomal aberrations (CAs) and DNA damage. These result indicate that WO3 NPs exhibit genotoxic activity in A. cepa root meristematic cells. Further studies should be conducted to better understand the molecular mechanisms involved in the genotoxicity of WO3 NPs.

Keywords: Allium, Comet Assay, DNA Damage, Cerium Oxide, Genotoxicity

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MODEL UPDATING OF STRUCTURES USING OPERATIONAL MODAL ANALYSIS

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Abstract:

Structural dynamic characteristics are determined by numerical and experimental methods. Experimental modal analysis is required for reliable identification of structure. However, finite element methods have been widely used to determine for static and dynamic characteristics of the structure. The finite element method is an effective technique to investigate behavior of structures under the static and dynamic loads. Nowadays, Operational Modal Analysis (OMA) method is used to determine for natural frequencies, mode shapes and damping ratios in many studies. This method is preferred because of nondestructive test all types of structures. This procedure, finite element analyses are carried out and obtained results are compared OMA results. This paper presents an evaluation of finite element model updating procedure taking into account the dynamic parameters. The finite element model is updated to converge the experimental results by changing material properties such as, Young's modulus, density and boundary conditions. Also, this study examines on updated models chancing material properties according to initial models.

Keywords: Operational Modal Analysis, Finite-Element, Updating Model

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ONE- AND TWO- DIMENSIONAL PLANE STRUCTURES ON ELASTIC FOUNDATION

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Abstract:

Many studies have been concerned to predict the mechanical behaviour characteristics of one and two plane structure on elastic foundations in engineering practice. Up to now, it has been developed many numerical analysis for engineering application. The effects of many parameters are investigated by researchers on structural members in form beam and plate. This paper investigates basic formulation for bending, buckling and free vibrations of one- and two dimensional plane structures on elastic foundations with different boundary conditions. Firstly, this study explains Euler-Bernoulli, Timoshenko beam theories for modelling of one dimensional structures, Kirchhoff, Mindlin plate theories for two dimensional structures and Pasternak, Winkler elastic foundation models. Afterwards, detailed parametric studies and functions are presented for behaviour of structure on elastic medium in recent. Finally, by taking into account the elastic foundation effect new applications are discussed for bending, buckling loads and free vibration of microstructures which have become popular in nanotechnology in recent times.

Keywords: Static, Buckling And Free Vibrations, Elastic Foundation, Microstructure

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COMPUTATIONAL STUDY OF ELECTRONIC AND DYNAMIC PROPERTIES OF HFIRAS IN THE LIALSI TYPE STRUCTURE

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Abstract:

The structural, electronic, elastic and phonon properties of HfIrAs in the AlLiSi structure have been investigated using the density functional theory (DFT) within the generalized gradient approximation (GGA). The optimized lattice constant (a0), bulk modulus (B) and the elastic constants (Cij) are evaluated. Our calculated electronic structure is also compared in detail with available data. . The mechanical properties such as bulk modulus (B), its pressure derivative (B'), the Poisson's ratio and the elastic constants (Cij) are obtained and compared with the literature. A linear-response approach to the density functional theory is used to derive phonon dispersion curve and the total and partial density of states for HfIrAs. The high-frequency region of HfIrAs is mainly due to the vibrations of Hf atoms. HfIrAs is also found to be dynamically stable in this phase based upon the phonon dispersion curve and total density of states. This work was supported by the Ahi Evran University Scientific Research Projects Coordination Unit. Project Number FEF.A4.18.006.

Keywords: Ab Initio. Electronic Properties, Mechanical Properties

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FIRST-PRINCIPLES STUDY OF ELECTRONIC AND DYNAMIC PROPERTIES OF RU2TIAL ALLOY

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Abstract:

The electronic band structure, elastic and vibrational spectra of Ru2TiAl alloy was computed in detail by employing an ab-initio pseudopotential method and a linear-response technique based on the density-functional theory (DFT) scheme within a generalized gradient approximation (GGA). Computed lattice constants, bulk modulus and elastic constants were compared with literature. The elastic constants, shear modulus, Young modulus, Poisson's ratio, B/G ratio electronic band structure, total and partial density of states, and total magnetic moment of the alloy was also presented. Stability evolution of alloy suggests that it is mechanically stable in the L21 phase. The calculated total density of states suggest that Ru2TiAl is metallic in nature where Fermi level is dominated by the first element's d electrons for the alloy. Full phonon spectra of Ru2TiAl alloy in the L21 phase was collected using the ab-initio linear response method. The obtained phonon frequencies were in the positive region indicating that Ru2TiAl is dynamically stable. This work was supported by the Ahi Evran University Scientific Research Projects Coordination Unit. Project Number FEF.A4.18.006.

Keywords: First-Princible Calculations, Structural, Electronic, Mechanical Properties

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DETERMINATION OF PERFLUOROOCTANOIC ACID (PFOA) AND PERFLUOROOCTANE SULFONIC ACID (PFOS) IN LIVESTOCK FEEDS

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Abstract:

The objective of this study was to investigate levels of perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) in livestock feeds (calf starter rations, dairy cattle rations, fattening cattle, calf growth feed, lamb starter rations, lamb growth, dairy sheep, fattening sheep, chick feed, broiler feed, layer chicken) and feed raw materials (wheat, cottonseed meal, wheat bran, maize, barley, lentil, wheat straw, bean straw, pea straw, meadow grass). The results obtained show that all of the investigated livestock feeds and feed raw materials contain perfluorinated compounds. The PFOA concentrations determined for the feed samples were listed as poultry > cattle > feed raw materials > small ruminant, while PFOS concentrations were listed as cattle > poultry > small ruminant > feed raw materials. The highest PFOA concentrations were determined in layer chicken (7.55 µg kg-1), dairy cattle rations (6.75 µg kg-1), and fattening cattle (6.53 µg kg-1). The highest PFOS levels were also found in layer chicken (0.882 µg kg-1), calf growth feed (0.833 µg kg-1), and dairy sheep (0.830 µg kg-1).

Keywords: Perfluorooctanoic Acid (PFOA), Perfluorooctane Sulfonic Acid (PFOS), Livestock Feeds Feed, LC-MS/M

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EXTRACTION OF BIOACTIVE COMPOUNDS OF WILD BILBERRY (VACCINIUM MYRTILLUS L.) GROWN IN GIRESUN PROVINCE

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Abstract:

Bilberry (Vaccinium myrtillus L.) is a wild fruit grown in the Black Sea region in Turkey, especially in Giresun province. Bilberry contains high levels of polyphenols, flavonoids, anthocyanins, and components that exhibit significant cytotoxic activities. It is the fact that, extraction efficiency and keeping the stability and activity of these compounds constant are very critical due to the labile nature of them. A comparative study for optimizing bilberry anthocyanin extraction appears to be lacking, despite a large number of publications on the subject. In the present study, the objective was to determine the most effective extraction method which yields the maximum amount of total phenolic, anthocyanin and flavonoid content in the extract. Within this context, three different extraction methods as solvent maceration, ultrasound assisted extraction (UAE) and microwave assisted extraction (MAE) were applied to maximize the bioactive compounds in the bilberry extracts. The concentrations of bioactive compounds were determined by spectrophotometric methods. Among these extraction methods, microwave assisted extraction was the most effective method to extract both anthocyanins (385 mg cyanidin 3-glucoside equivalents/ 100 gram fresh weight), polyphenolic components (889 mg Gallic acid equivalents/ 100 g FW) and flavonoids (12.75 mg quercetin equivalent/ 100 g FW). Major anthocyanins of the extract were delphinidin, malvidin, cyanidin and their glycosides, which were determined quantitatively by their extinction coefficients observed with their standards. Because of this high amount of bioactive components, the bilberry is an important food source and can be used in the functional food production.

Keywords: Bilberry, Bioactive Compounds, Extraction Methods, Flavonoids

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BLUEBERRY ANTHOCYANINS FOR FUNCTIONAL FOOD PRODUCTION

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Abstract:

Blueberries spread in the Black Sea Region and have started to be evaluated commercially since 2010. It is becoming increasingly popular due to the bioactive components of it and this property reveals the widespread use of blueberry fruit itself in food products. Blueberry extracts include flavonoids, flavanones, phenolic acids and anthocyanin. Anthocyanins have remarkable pigment potential for being used in food industry. For this reason, it is expected that in the near future all these nutritional and functional compounds will be potentially regarded as a functional product in the food industry. The incorporation of blueberry anthocyanin to the milk and dairy products (yogurt, cheese, cream, ice cream, etc.), bakery products (cakes, muffins, breads, etc.) and confectionery products (candies, gums, soft jellies etc.) yields functional products, which may have antioxidant and antimicrobial and health promoting function. However, it is very important to optimize the food processing conditions in order to minimize the loss of stability and activities of these compounds during processing. In this study, the functional components of commercially grown blueberries in the Black Sea Region have been investigated in terms of total phenols (Folin-Ciocelteau method), anthocyanins (cyanidin-3-o glucoside) and flavonoids using different extraction conditions. Highest total phenol content was found as 346 gallic acid equivalent, flavonoid content as 17.9 quarcetin equivalent and 115.78 cyanidin equivalent, per 100 gram fresh fruit with the microwave assisted extraction. These remarkable results are very promising for food industrial applications. Therefore, the blueberry active components exhibit considerable potential in functional food product developments.

Keywords: Functional Food, Blueberry Anthocyanins, Bioactive Compounds

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TEXT PREPROCESSING FOR AN EXPERIMENT CODE ON THE INTERNET ASSISTED LABORATORY SYSTEM

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Abstract:

In this study, a text preprocessing application in an engineering experiment system for the Internet assisted laboratory is proposed. Distance education has a key part in today's education system. Unlike the conventional education, students can access educational resources distantly via their computers and mobile devices. This provides students the flexibility they need allowing them to learn while continuing to their daily lives. Static and dynamic Web sites are designed to serve for this purpose replaces traditional classes and books. Natural sciences, especially the engineering programs specifically require laboratory training. Distance education solutions provided mostly based on hands-on education for a desired period, simulations mimicking real laboratory environments and online real laboratories. The educational goal is met as much as the online lab to be realized is similar to a real lab. In order to provide an online laboratory which allows students to execute engineering experiments, we have developed an Internet assisted laboratory infrastructure powered by a code preprocessing software. In this online laboratory system, the laboratory equipment is inspected and intervened as many as necessary by our software for stability, security and durability of the execution subsystem and its target hardware controlled by students' code. This task, which is essential for a flexible Internet assisted laboratory, is carried out by evaluating and manipulating the student's control code where necessary. We have successfully developed an experiment management software which monitors the students' experiment code, and an execution subsystem which runs the experiment code on a distant laboratory equipment.

Keywords: Distance Education, Text Preprocessing, Distant Laboratory, Internet Assisted Laboratory

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GENETIC ALGORITHM AND FUZZY LOGIC BASED AUTO-TEST SYSTEM FOR DISTANCE EDUCATION

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Abstract:

In this study, a genetic algorithm and a fuzzy logic based multiple choice test system is proposed. Learning is the process by which knowledge or skill creates long-term behavioral changes on individuals. Examinations are needed to measure the effectiveness of the learning process. These exams can be prepared by an instructor or automatically by means of a computer. Nowadays, with the widespread use of internet distance education has become popular, thus the necessity of creating an automatic exam through the internet has emerged. Although there are many methods for testing knowledge and skill acquired through learning, one of the most effective methods of measurement is multiple-choice test. The level of learning can be measured correctly by selecting the appropriate questions by optimizing the combination of the questions. Different attributes can be used in the selection of the questions included in the test to be created. Generally, the questions to be included in the multiple choice test are determined by the user determined difficulty, discrimination index and the frequency of the questionnaire. In the proposed system, the fitness function in the genetic algorithm consists of these attributes and is calculated using the fuzzy logic. It has been found that the system using the fuzzy logic is more successfull than the system those not using the fuzzy logic when compared to each other.

Keywords: Genetic Algorithm, Fuzzy Logic, Exam Evaluation, Multiple Choice Test

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DETERMINATION OF PARAMETERS EFFECTING AGING HEAT TREATMENT OF AA7075 ALUMINUM ALLOY BY RESPONSE SURFACE METHOD

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Abstract:

In this study, one of the important alloys group of AA7075 was held to obtain the optimum aging heat treatment conditions by response surface method. AA7075 alloy is an important alloy especially for aerospace applications, for its higher specific strength respect to other engineering materials.

In this study, three cold working rates of 0%, 20%, and 40%, and three aging temperatures 150 °C, 200°C, and 250 °C, and three aging treatment times of 2 hours, 4hours, and 6 hours were applied to AA7075 aluminum alloy to investigate the effect of these parameters on its Vickers hardness. Experiments, which were planned according to a three parameters and three levels Box-Behnken design, which is a type of response surface method, were carried out in predetermined conditions.

According to the design of experiments results, first and second order of temperature has the most significant parameter on the hardness of AA7075 alloy. The first order of time parameter was found statistically significant at 92% confidence level. Only the interaction between temperature and time parameter was determined significant at 85% significance level. The rest of parameters were determined insignificant.

A second order and statistically significant mathematical model with 0.9565 determination coefficient, predicting hardness of AA7075 alloy at 95% significance level, was obtained. Lack of fit was insignificant and it's predicted versus actual harness values are very good agreement. According to the optimization evaluation revealed that optimum hardness values of 145.18 can be obtained when the sample should be treated at 182 °C temperature for 2 hours and 0% aging procedure.

Keywords: Response Surface Method, Box-Behnken Design, AA7075 Alloy, Aging, Vickers Hardness

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THE MODELLING OF WIND POWER ACCORDING TO VARIOUS WEATHER CONDITIONS IN TURKEY BY USING LINEER REGRESION METHOD

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Abstract:

The fossil fuels have decreased day by day and use of these has caused damage the environment. So, the world has tended to the renewable energy resources. One of the most significant of these resources is the wind energy potential. When geographical situation of Turkey is considered, Turkey has quite important position with regards to wind energy potential. There are some requirement steps to construct the wind turbine for generating electrical energy from the wind. These steps are measurement of wind speed, assessment of measured data, determining of energy potential and choosing turbine, respectively. In this study, necessary the most important parameters such as air temperature, wind speed at 10 meters of last 20 years are supplied from Turkish State Meteorological Service. These data are classified for assessment of the wind power potential of each cities in Turkey. Wind power per unit area has been modeled by using roughness coefficient (k), for different air conditions such as heavy and clear. According to found results, the wind power map of Turkey has been obtained. This map can use to determine the optimum locations about setup of wind turbines.

Keywords: Wind Speed, Wind Power, Turkey

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ESTIMATION OF MACHINING OUTPUTS IN DRILLING OF AISI 430 STAINLESS STEEL BY NUMERICAL ANALYSIS

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Abstract:

Drilling is an inevitable process used in the manufacture of many industrial products among the machining operations, as well as a difficult cutting mechanism due to the difficulty of the chip formation process. In drilling, the cutting tool-material pair characteristics in addition to the cutting parameters affect the machining efficiency depending on the machining outputs such as surface quality, cutting force, tool life, amount of energy consumed. In this context, it is possible to predict machining outputs by making cutting simulations based on the finite element method in order to contribute to sustainable manufacturing. The study presents the drillability of AISI 430 stainless steel through drilling simulations based on numerical analysis. Drilling operations were performed with uncoated carbide drill at three different cutting speeds (40, 60, 80 m/min) and feed rate (0.1, 0.2, 0.3 mm / rev). The effects of the drilling parameters on the thrust force, torque and cutting temperature were investigated in drilling of the ferritic stainless steel. According to the results obtained by drilling simulations, it was determined that the thrust force and torque increases as the cutting speed and feed rate increases. Also, the analysis of variance showed that the feed rate is the most important parameter for the machining outputs.

Keywords: Drilling, AISI 430, Finite Element Method, Thrust Force, Torque, Cutting Temperature

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INVESTIGATION OF THE HOLE QUALITY DURING FIBER LASER DRILLING OF FERRITIC STAINLESS STEEL

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Abstract:

Laser drilling, which provides the manufacturing of high precision and complex parts, is one of the unconventional machining methods. In the laser drilling process, the basic parameters that are especially focal point, gas pressure and feed speed play an important role over product quality by affecting cutting process directly. These parameters significantly affect the machining efficiency as well as the machining outputs such as burr formation and hole quality. Therefore, it is important to determine the optimum parameter levels according to workpiece in terms of machining efficiency during laser drilling. In this study, the drillability of AISI 430 stainless steel with laser cutting method was investigated. Drilling operations are performed at three different focal point (0, -1, -2 mm), pressure (10,12,14 bar), and feed speed (1200, 1400, 1600 mm/min). In drilling of stainless steel by laser, the effects of the drilling parameters over the burr formation and the hole quality were analyzed. As a result of the evaluations, it was determined that the burr volume increases when the material rate which is molten by gas pressure increases. Moreover, it was obtained that the hole size is the nearest to nominal diameter in the experiment where the gas pressure and focal point is the minimum.

Keywords: Ferritic Stainless Steel, Fiber Laser Drilling, Hole Quality, Burr Formation

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EFFECT OF LED POSITION ON MASS TRANSFER OF HAZELNUT (CORYLUS AVELLANA L.)

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Abstract:

The most important of the main agricultural livelihoods of the Black Sea region of Turkey is hazelnut. This region accounts for about 70% of the total world hazelnut (Corylus Avellana L.) production. Hazelnut harvest in the region has generally been carried out in the months of August and September in which the rain and relative humidity is rather high. Average moisture content of harvested hazelnuts was around 30% which has to be lowered to 6% in order to preserve food characteristics of hazelnut kernels for a prolonged storage. Therefore, lowering moisture content of hazelnuts to 6% by sun-drying takes quite a long time and caused quality losses and deteriorations in the kernels. There has long been a need for a mechanical drying system, preserving hazelnut quality with reduced cost in a short time, that can be used both by the producers and manufacturers. An experimental study using a LED with a color temperature of 6500 K as an energy source has been carried out. A mechanical drying system with natural circulation was designed and the effect of increase in the distance between LED and hazelnut (L=5 cm, 10 cm, and 15 cm) on the mass transfer of hazelnut was investigated. The hazelnut kernels of 16-17 mm diameters were LED, sun and oven dried and the drying was terminated when the kernel moisture dropped below 6%. The time-dependent mass losses of hazelnuts in the system and temperature changes in the environment and inside of hazelnut were measured. The LED drying of 5, 10 and 15 cm distance and sun drying took 74%, 72%, 69%, 52% shorter time, in comparison to sun drying. The internal temperature of hazelnut kernels decreased depending on the increasing distance in LED drying.

Keywords: Fruit Drying, Hazelnut Moisture, LED Color Temperature, Mass Losses, Sun Drying.

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DESIGN OF COMPRESSED NATURAL GAS-AIR MIXER FOR A SINGLE CYLINDER GAS ENGINE

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Abstract:

Natural gas is an alternative clean energy source for use in internal combustion engines. Adaptation to engine of compressed natural gas (CNG) is achieved with small modifications that made on engine. In this study, it is designed the venturi type CNG-Air mixer to provide the proper air-fuel mixture. CNG-Air mixer is modelled based on Bernoulli principle and venturi effect. In this model, Computational Fluid Dynamics (CFD) analysis was carried out by changing the holes number and diameter of the venturi type mixer. Venturi type CNG-Air mixer design calculations was estimated according to volumetric air/fuel ratio of an engine that have a single cylinder, four strokes, swept volume 661 cc, constant speed 1500 rpm, compression rate 10:1 and piston speed 9.95 m/s.

The Holes number and diameter of venturi type mixer was determined according to motor specifications. CFD analysis of the venturi type mixers were performed by calculated geometric features which 8 holes-2 mm radius and 10 holes-2 mm radius. Also, it was investigated the CNG inlet holes according to the angles of 90° and 45° on the venturi.

In the result of research, the CNG-air mixture ratio of the venturi type mixer is analysed successfully and it was determined that venturi type mixer have 90° CNG inlet is better than 45° CNG inlet. In addition, the most homogeneous mixture of the venturi type mixer outlet section is obtained by venturi type mixer have 90° CNG inlet and 10 holes.

Keywords: Fuel-Air Mixer, Cng Engine, Engine Cfd Analysis

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EFFECT OF COMPRESSION RATIO ON THE PERFORMANCE OF A NATURAL GAS FIRED ENGINE

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Abstract:

This study aims comparing in different compression ratios the combustion performance of a spark ignition engine operated with compressed natural gas (CNG). Experimental measurements were carried out on a single cylinder four stroke research engine test system. Engine torque, fuel and air consumption values were measured at different speeds of loaded engine. In the analyses, the combustion performance of CNG was compared showing with engine performance curves. Thermal efficiency, brake torque and power, volumetric efficiency, brake mean effective pressure and specific fuel consumption curves versus engine speeds, were determined in different compression ratios for CNG.

The engine was operated with CNG fuel successfully. CNG fuel was injected on the intake manifold where formed fuel-air mixture is and the charge was sent to cylinder of engine. In result of analyses, it was seen that specific fuel consumption decrease with increasing compression ratio. In addition, it is determined that volumetric efficiency decrease and that thermal efficiency increase versus increasing compression ratio.

Keywords: CNG Fuel, Combustion, Spark Ignition Engine, Engine Performance

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EXERGY ANALYSIS OF A CAMPUS HOUSING AREA IN COLD CLIMATE

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Abstract:

Exergy analysis appears to be a potential for system design, analysis, and process evaluation and improvement also exergy is a tool for tracing the useful portion of the energy flowing through a system. Energy analysis alone can often be misleading, as energy can be transformed to many forms with different levels of quality. An exergetic analysis of a system helps identify primary sources of loss and provides a more accurate picture of the performance relative to the theoretical ideal. A comprehensive exergy analysis of the Campus housings of the Van Yuzuncu Yil University is conducted in this study. The calculations carried out considering the urban area completely covering yearly based meteorological and domestic values. The results show that the housings are well designed and constructed considering the cold climate and the efficiencies reaches up to 30%. But it is also seen that the possibility of increment in the exergy efficiency is still a must for building sector.

Keywords: Exergy, Mass Housing, Efficiency

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MULTI-OBJECTIVE EXERGOECONOMIC DESIGN ASSESSMENT OF A SHELL AND TUBE HEAT EXCHANGER USING A HYBRID GENETIC ALGORITHM

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Abstract:

Heat exchangers are widely used as fundamental process equipment in chemical and thermal processes. Considering the increasing energy prices and decreasing fossil fuels, the efficient operation of energy intensive processes has higher importance with including the operation costs. This study presents the exergoeconomic analysis based design assessment of shell and tube heat exchanger (STHE) for heating ethanol-water mixture by using hot utility as water. The complex large scale mixed integer nonlinear programming (MINLP) problem of the design of STHE's solved using a developed hybrid genetic algorithm based computer program. The results of multi-objective problem reveals a Pareto solution set to be considered using a decision based system. A parametric investigation considering the decision weight given to the objectives are also applied. As result to the comprehensive analysis, it is found that the minimum Annual Fixed Cost (AFC) is 4289$/y with a triangular pitch and impact factor of 0.95 for minimum exergy destruction.

Keywords: Multi-Objective Optimization, Genetic Algorithm, Shell And Tube, Heat Exchanger, Exergy, Exergoeconomy

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EXERGOECONOMIC ANALYSIS OF AN URBAN AREA.

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Abstract:

The Exergoeconomic analysis of an urban area is introduced in this study covering a yearly based energy interaction. The indoor and outdoor temperatures, construction properties and yearly spend energy for heating purposes are taken into account in the study of year 2016. The urban area selected is the Campus housings of Van Yuzuncu Yil University which has been constructed in 2012 after Van Earthquakes. As being an important tool in understanding of the cost structure of the energy intensive sectors exergoeconomic analysis is introduced to the planning concept in this study covering the results of exergetic cost and exergy efficiency of the case urban area. The calculations carried out considering the urban area completely covering yearly based meteorological and domestic values. The results show that although being a well designed and constructed urban area since specific design considerations are not met there is plenty of space for improvements in cost reduction for especially such a location that has a cold climate.

Keywords: Exergoeconomy, Urban Area Planning, Mass Housing, Exergy, Efficiency

[*]The study is supported by Scientific Research Fund of the Van Yuzuncu Yil University (YYU-BAP) 2015_mim_B104

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BROWNFIELD SITES AS A TOOL FOR SUSTAINABLE DEVELOPMENT

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Abstract:

The transfer of limited amounts of resources to the future generations is a paramount endeavour in a perspective of sustainable development, especially considering the problems like global-scale urban population increase, scantiness of non-renewable energy resources and global warming. In that regard, sustainable area usage forms an important factor for sustainable development.

This article focuses on a project that rehabilitates and reuses a “mineral working quarry”. In this project, a sand quarry in Adilcevaz (Bitlis) that has ended its operations has been re-purposed by placement of solar panels in the site, in order to produce renewable energy. A total of 2084 solar panels were installed to the field that served as sand quarry before, and the plant started producing power with 502.75 kWp in 2013. The aim of this study is to emphasize the benefits of reusing brownfield areas for further sustainable development by inspecting the project in detail, which has contributed to the sustainable development in terms of utilization of passive energy resources by re-purposing the quarry area as a solar panel farm.

Keywords: Brownfield, Sustainable Land, Mine Land Reclamation, Reuse, Solar Power Plant.

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A TRAFFIC SYSTEMATIC PROPOSAL FOR MANNED AND UNMANNED AERIAL VEHICLES ENCOUNTER

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Abstract:

The basics of traffic rules and a central observer system of aerial traffic during a manned and unmanned aerial vehicle encounter have been studied here. Number of commercial unmanned aerial vehicles is expected to reach 400 000 at 2050 and most of them are going to be flying around cities. On the other hand there will also be many aerial vehicles fled by men. Basic and easy to apply rules will be very helpful in terms of safety of the flights. Prioritization of the aerial vehicles according to their types, level of autonomy, weight of cargo they carry, number of people they carry, energy they consume, fuel level, state of being urgent and most importantly the maneuverability of the vehicles. Traffic rules and a central system for observing the vehicles during their flight in terms of keeping the rules will be adaptively designed according to the concentration of the traffic.

Keywords: Uav, Air Traffic, Classification, Aerial Vehicle, Autonomy

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MODIFIED ION MOTION ALGORITHM FOR TYPE - II ASSEMBLY LINE BALANCING PROBLEM

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Abstract:

Assembly lines are crucial in mass production systems to produce high quantity standardized products. The simple assembly line balancing (SALB) problems are interested in assigning the tasks to the workstation so as to satisfy the precedence constraints.

In Type I Assembly Line Problems (ALBP), the number of workstations or the cost of the assembly line is minimized for a given cycle time. Type II ALBP minimizes the cycle time by assigning the tasks to the stations.

Meta-heuristics have been extensively used for solving large-scale and complex optimization problems. Ion Motion Optimization algorithm (IMO) has some advantageous over other recently proposed meta-heuristics in terms of diversification and intensification capabilities, low computational load and high execution speed. In this study a modified IMO algorithm is implemented to solve Type II ALBP by taking into consideration of different production capabilities of robots. The intensification and diversification mechanisms of IMO algorithm are modified to make it suitable for the specialties of the problem addressed in this study. Well-known and most widely used benchmark problems in the assembly line balancing literature are evaluated to analyze the performance of the proposed solution approach. Advantages and disadvantages of the modified IMO algorithm are presented for the future studies.

Keywords: Ion Motion Algorithm, Assembly Line Balancing, Metaheuristic

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CREW ROSTERING PROBLEM IN RAILWAY TRANSPORTATION

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Abstract:

Transportation planning problems gain more importance due to their practical implications. Crew-pairing problems in airline transportation having been widely studied by the researchers focused on crew scheduling problems. But in recent years, with the expansion of railway transportation systems, crew scheduling problems in railways have been emphasized. In this study, crew rostering problem of railways in public transportation is addressed to gain advantage in crew costs having an important part in the railway operational costs. A mathematical model is proposed to solve this scheduling problem by considering all legal and operational constraints. Duties generated from train timetables, operational constraints and work rules composed of the data for the mixed integer mathematical model. Each duty that performed by a machinist consists of different tasks (trips) with varying breaks and working times. So as to obtain balanced monthly schedules, multiple objectives are taken into account due to the requirements of railway planners. Total number of machinists, overtimes during the planning period, differences between average break times are determined as the components of the objective function. For two different railway line, all 154 duties that are repeated daily are determined to be scheduled to obtain monthly crew schedules. These duties vary on weekdays and weekend days, Saturday and Sunday. After the optimization of crew scheduling model, number of machinists has been reduced to 11.12% according to the comparisons with the operating system. Besides this, the workload balance among machinists is improved in terms of night and day shifts, daily break times, daily working times and overtimes.

Keywords: Crew Rostering, Light Railway Systems, 0-1 Mixed Integer Model

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THE EFFECTS OF VINCRISTINE SULFATE ON THE PRESENCE OF MMP-2 AND MMP-9 ENZYMES IN BITCHES WITH NATURALLY OCCURRING TRANSMISSIBLE VENEREAL TUMOR

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Abstract:

This study was carried out the tumoral tissues of female dog with approval number 2016 / 05-05 from Namik Kemal University Experimental Animals Local Ethics Committee. Before and after treatment, tumor tissues obtained 2-12 years old, 30 female dogs with spontaneous Transmissible Venereal Tumor, were taken from the vestibulum region which came to private veterinary clinics in Tekirdag region and Uludag University, Veterinary Faculty, Department of Obstetrics and Gynecology. Tissues were fixed overnight. Routine tissue process was performed. The slides were stained with hematoxylin eosine, examined under the light microscope and the histopathological findings were recorded. The tissues diagnosed with TVT were stained immunohistochemically for comparing the presence of MMP-2 and MMP-9 enzymes before and after treatment. Statistical comparison was made between the groups. During the treatment, commercial dog food and free water were given. Vincristine sulfate (Vincristine DBL, Mayne Pharma Pty Ltd, Australia) was administered weekly with 10 ml physiologic saline at a dose of 0.025 mg/kg, via slow intravenous injection. During the treatment, hematological values were controlled. The treatment was continued until the absence of tumors or continued for up to 7 weeks. There was no statistical difference in the immunohistochemical staining rate and severity of MMP-2 and MMP-9 enzymes before and after treatment. However, after treatment, the median value of MMP-2 enzyme was lower than before. There is no study about showing the presence of MMP-2 and MMP-9 enzymes before and after treatment with vincristine sulfate, so the literature is expected to provide new information.

Keywords: Immunohistochemical, MMP-2, MMP-9, Vincristine Sulfate, Transmissible Venereal Tumor

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DERTERMINATION OF MIDDLE MARMARA'S SEISMIC TOMOGRAPY

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Abstract:

In this study, a seismic tomography technique was applied to arrival time data generated by 923 crustal earthquakes occurred between years 2016 and 2017 in central Marmara in order to study Vp, Vs and Poisson Ratio structures and their relation with seismic activities occurring in the study region. Study area bordered with 40N – 42 N latitude and 27 E – 30 Ê longitude. The inversion results indicate the existence of strong lateral heterogeneities in the crust and uppermost mantle beneath central Marmara. Low-velocity anomalies are imaged the existing active fault segments beneath the study area. Vp, Vs wawes velocity ratio and Poisson Ratio values coherence with Earthquakes occurred in 2016, obtained in the study area. In the same time, study area which is under stress and which is not, obtained with active earthquake activity areas or unactive areas. The obtained the velocity and Vp, Vs ve Poisson Ratio values are consistent with previous geophysical measurements conducted beneath central Marmara and give understanding of the current seismotectonic activities in this region.

Keywords: Key Words : Marmara , Siesmic Tomography, Velocity, Vp,Vs

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DESIGN AND PERFORMANCE ANALYSIS OF A COMPACT PRINTED CIRCUIT HEAT EXCHANGER (PCHE) USED IN THE WASTE HEAT RECOVERY SYSTEMS (WHRS) IN SHIPS

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Abstract:

In order to increase the energy efficiency in ship operations, the waste heat recovery systems (WHRS) that recover heat from ship's main engine exhaust gases are commonly used. Because conventional shell and tube heat exchangers are heavier and take up larger space, the usage of micro-channel heat exchangers, namely diffusion-bonded printed circuit heat exchangers (PCHE) has gained much attention recently in the maritime industry. They are also popularly used in nuclear power plants because of their advantages of having higher surface-area-to-volume ratio, higher pressure/temperature resistance and higher heat transfer efficiency. Predicting the heat transfer coefficient and the pressure drop in micro-channels is of a great importance in designing PCHEs and optimizing the power cycles. Modification of the geometrical characteristics of the heat exchangers and the variation of the thermal properties of the running fluid with high temperature are crucial factors in thermo-hydraulic design of PCHEs. In this study, the thermal and hydraulic performances of PCHE with different micro channel characteristics were investigated at different Reynolds number. Numerical analysis were conducted with k – ω turbulent model using a commercial CFD code, ANSYS CFX. Finally, a comparison with mathematical model is made. NTU-effectiveness method is used in designing and conducting the thermal-hydraulic performance analyses of the heat exchangers. The comparison is made for specified initial pressure and temperature conditions. Using compact PCHEs in ships has been found to be advantageous in terms of weight, system layout, maintenance & operation, cost and thermal-hydraulic performance.

Keywords: Compact Heat Exchangers, Printed Circuit Heat Exchanger, Waste Heat Recovery System

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DESIGN AND OPTIMIZATION OF COMPACT PRINTED CIRCUIT HEAT EXCHANGER AS S-CO2 BRAYTON CYCLE REGENERATOR BY USING SUB-HEAT EXCHANGER MODEL

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Abstract:

The super-critical carbon-dioxide (s-CO2) regenerative Brayton power cycle comes to forefront with its high thermal efficiency and high power density. The s-CO2 Brayton cycle achieves compact turbo-machine dimensions thanks to its high power density advantage. In addition, compact heat exchangers are also needed to build compact power systems. In this study, compact printed circuit heat exchanger (PCHE) as Brayton cycle regenerator was designed by using sub-heat exchanger model. Sub-heat exchanger model gives better results when compared bulk temperature approach because of fluxional thermo-physical properties of s-CO2. Heat exchanger structural design is made according to American Society of Mechanical Engineers (ASME) standards. Thermal performance analyzes were performed using both logarithmic mean temperature difference (LMTD) and number of transfer units (NTU)-effectiveness methods. Different Nusselt and different friction factor correlations are used in the thermal-hydraulic performance analyzes and the results are presented in comparison. The effects of different channel diameters on heat exchanger size and weight have been examined. PCHEs are seen to be advantageous in terms of size and weight thanks to their compact structure.

Keywords: Super-Critical Carbon-Dioxide, Printed Circuit Heat Exchanger, Sub-Heat Exchanger Model

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AN INVESTIGATION OF LEAD-ZINC ON THE STRENGTH OF CLAY SOIL AS USING FLY ASH AND CEMENT

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Abstract:

Today, due to the increasement of industrial factories, nuclear plants and mineral exploration leads a large quantity of mine dumps. This situation conducts civil, environmental and geotechnical engineers to find out new methods of storage for tailings. In this study, lead-zinc (Pb-Zn), mine tailing which was being extracted in Balikesir-Balya Province in Turkey and clay soils were admixed in different percentages. Lead-zinc additives were mixed with clay in the ratios of %5, %10, %20, %40, %60, %80 and %100 by weight of soil. According to unconfined compression tests, the highest value was obtained in %20 lead-zinc additive with clay. During research, index,consistency, compaction and strength properties of the obtained samples were examined. Then, flying ash as a second industrial waste and cement (CEM I 42,5 R) were added to lead-zinc-clay samples in different ratios. As a result of unconfined compression tests, fly ash enhanced the strength of lead-zinc-clay samples by about %200. On the other hand, cement increased the resistance of lead-zinc-clay-fly ash samples by around %700. As a conclusion, it was observed that lead-zinc (Pb-Zn) mining waste can be mixed with clay soils by appropriate ratio to get growth on strength features of clay. In addition, fly ash and cement have prominent and concrete effect on clay stabilization.

Keywords: Clay Stabilization, Cement, Fly Ash, Mining Waste, Lead-Zinc, Unconfined Compression

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GEOCHEMICAL PROPERTIES OF TUFFS IN THE YENICE-SARAYCIK AREA; SOUTHWESTERN PART OF DEMIRCI (MANISA,TURKEY)

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Abstract:

The study area, the Yenice-Saraycik area, is located on the southwestern part of the Demirci (Manisa) area. Tuffs intercalated with the Neojene fluvial-lacustrine sediments, are exposed in the study area. These tuffs are commonly either altered to zeolites and/or clay minerals.

The samples taken from outcrops of the tuffs in the Yenice-Saraycik area were analyzed to identify their geochemical characteristics. Chemical analysis were conducted bu using inductively coupled plasma-emission spectrometry (ICP-ES) for major elements and by inductively coupled plasma-mass spectrometry (ICP-MS) for trace elements, including rare earth elements (REE). Results from analysis exhibited that tuffs are silica-rich (>60 wt. %) and calc-alkaline. They are also peraluminous and predominantly rhyolitic or rhyodacitic in composition. Chondrite-normalized REE patterns of all studied samples are similar to each other and characterized by light REE (LREE) enrichment, strong negative Eu anomalies and relatively flat heavy REE (HREE). The existence of strong negative Eu anomalies point out crystal fractionation of feldspar. On primitive mantle-normalized trace elements spider plots, all samples display parallel patterns characterized by sharp negative anomalies of Nb, Ti and P along with positive anomalies of Pb and K. These data reveal that tuffs originated from a strongly evolved magma which was probably contaminated by crustal material. Also, the negative anomalies of Nb, P and Ti suggest a subduction-related origin.

On the other hand, the alteration of tuffs to zeolites and clays has caused noticeable changes on their chemical composition. The zeolitic tuffs contain higher Mg, Ca, P and LOI in comparison to zeolite-free tuffs, but lower K, Na and Mn. The significant increase of Ba, Sr, Cs, Pb, Zn, Ni, As and Sb in the zeolitic tuffs were also detected. Furthermore, a little mobility of HREEs relative to LREEs was identified in most of the zeolitic samples.

Keywords: Tuff; Geochemistry ; Alteration; Zeolite

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EFFECT OF HEAT PRE-TREATMENT ON BIOETHANOL PRODUCTION BY SYNGAS FERMENTATION USING MIXED CULTURES

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Abstract:

Ethanol can produced biologically (bioethanol) by direct fermentation from first generation sources (sugar beet, corn, glucose) and by indirect fermentation from second generation sources (lignocellulosic wastes such as municipal solid wastes, grass, field wastes) which degraded by chemical pretreatment into sugars. Because of the disadvantages of first generation sources being used as food sources at the same time and pre-treatments being applied in second generation sources, synthesis gas fermentation and ethanol production are among the current issues of today. Syngas is a gas mixture of CO, CO2, N2, H2 and CH4 obtained by gasification and pyrolysis of biomass. It is known as toxic gas due to its CO content. In this study the syngas from pyrolysis of olive leaves was collected. The compositions of CO2 and CO gases were found as 56% and 16% respectively. The mixed culture of anaerobic bacteria taken from an anaerobic biogas reactor of dairy industry was used for bioethanol production. The effect of gas amount (5,10,15 mL) and also the heat pre-treatment at (105 °for 5 mins at autoclave) were detected in 100 mL batch reactors having 50 mL working volume. Up to 6 g/L bioethanol production was observed. Heat pre-treatment enhanced the bioethanol production performances.

Keywords: Bioethanol, Syngas Fermentation, Batch Reactors, Anaerobic Mixed Culture

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DEVELOPMENT OF ECOLOGICAL BIODESIGN PRODUCTS BY BACTERIAL BIOCALCIFICATION

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Abstract:

Biodesign is an interdisciplinary field in which biological processes are combined with many different fields to produce environmentally friendly and economically feasible products. Within the scope of this study, first CaCO3 production potential of Sporosarcina pasteurii has been observed and optimized, and then the capability of hardening of the sand is examined. In this study the growth curve of Sporosarcina pasteurii was sketched. Also the optimum CaCl2 concentration for maximized CaCO3 formation was found as 50 mM. The ecological urban element was designed and its mold was produced by 3D printer at lab scale. The Sporosarcina pasteurii was mixed with sand and filled into the mold. The sand was mixed with 50 mM CaCl2 solution every day until hardening is observed. At the end of one week, a sitting element from hardened sand was produced. The CaCO3 formation was observed with XPS analysis. Thus, an interdisciplinary approach was used to produce ecological biodesign products. .

Keywords: Biocalcification, Biodesign, Urban Living Elements, Sand Hardening, Sporosarcina Pasteurii

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ANALYTICAL SOLUTION AND COMPARISON OF SLIP FLUID FLOW IN A CIRCULAR MICRO-CHANNEL WITH FIRST AND SECOND ORDER BOUNDARY CONDITIONS

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Abstract:

Micro scale electro-mechanical systems recently possess higher importance in applications such as automotive, defense industry, aviation and space systems, bio-medical and nuclear energy. Each day, transferred heat per unit area/volume in these improving systems continuously increase and serious heat and flow problems emerge due to some various factors. In order to solve these mentioned problems, the experimental investigations are not enough because of their micro scales. In addition, the slip flow phenomenon that occurs in the micro structure greatly affects the solution approaches of the problems. So that, analytical and numerical solutions have become important for these studies.

In this study, momentum equations describing gas flow in circular microchannels are analytically solved for first and second order slip flow boundary conditions. The results obtained are tabulated and graphically presented and compared with each other for different Knudsen numbers. The results showed that, when Knudsen number is larger than 0.5, the second order slip flow boundary condition gives a more realistic result.

Keywords: Microchannel Flow, Micro-Pipe, Slip Flow, Rarefaction Effect

[*]This study is supported by Scientific Project Support Program of Selcuk University

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AN INVESTIGATION OF INCREASE THE EFFECTIVENESS OF OHMIC COOKING OF MEAT BY USING WITH ULTRASOUND TREATMENT

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Abstract:

Cooking of meat is a very important process for providing its microbiological quality, sensory characteristics, better digestibility and nutritive value. The method of cooking is one of the major factors that affects the eating quality of beef meat. In conventional cooking methods such as grilling, frying, roasting, boiling, smoking, meat is exposed to elevated temperatures, the outside may be overcooked with the interior insufficiently cooked since low rate of heat penetration to the thermal centre and this will lead to a reduction in the quality of the beef meat. Consumption of this meat product is known to cause intestinal, stomach cancer and increase risk of pancreatic cancer. For this reason, alternative cooking technologies, especially ohmic cooking that enables faster cooking, less power consumption and safer product have gained importance in recent years. However, meat has heteregenous and compact muscle fibers structure. For this reason, in this review, increase the effectiveness of ohmic treatment for cooking meat by using with the combination of ultrasound treatment thought was searched and developed.

Keywords: Ohmic Cooking, Ultrasound Treatment, Beef Meat

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EFFECT OF OHMIC COOKING METHOD ALONE ON MOISTURE CONTENT AND TOTAL AEROBIC MESOPHILIC COUNT OF BEEF MUSCLE

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Abstract:

In this study, effects of ohmic cooking alone on moisture content and total aerobic mesophilic count of beef meat was investigated. The ohmic cooking was performed by applying three different voltage gradient which are 40, 55 and 70 V/cm for 7 minutes. The increase in voltage value caused to affect the moisture content of beef muscle insignificantly ($p > 0.05$) while affecting ($p < 0.05$) the total aerobic mesophilic count of beef significantly during the ohmic cooking process. The levels of total aerobic mesophilic count in raw meat were detected 5.7 log cfu/g. At 40 V, 55 V and 70 V total aerobic mesophilic count significantly reduced to 4.6, 4.3, 4.0 log cfu/g, but inhibition of all of the microrganisms could not be succeed. The results obtained in this study revealed that ohmic cooking process alone is not a sufficient cooking method for reaching better safety parameters of beef meat.

Keywords: Ohmic Cooking, Moisture Content, Microbiology, Beef Meat

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EXAMINATION OF THE EFFECTS OF PRESSURE TRANSDUCER TYPES TO LIQUID SLOSHING IN SHIP TANKS

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Abstract:

Liquid sloshing is associated with water flow on the shipboard and motions of liquid in tanks of the ships. In this study, the types of pressure transducer used in model tanks for ships, and their effects have been examined based on the experimental studies in the literature. Although, the numerical techniques about liquid sloshing in tanks show the remarkable development, the high quality experimental studies always need to be improved continuously with using advanced sensor devices for validating the numerical solutions. Pressure transducers are one of the most important sensor devices to measure the gases or liquids in ship tanks. They are generally consisting of three types of electrical output; millivolt, amplified voltage and 4-20 mA. Millivolt output pressure transducers are the most economical pressure transducers. Their output values are directly proportional to the pressure transducer input excitation. They should not be located in an electrically noisy environment due to the output values are too low. Amplified voltage pressure transducers have 0-5 V or 0-10 V DC output signal. They can be more used than millivolt output pressure transducers in industrial environments because it is more resistant to electrical noise. 4-20 mA output pressure transducers are also less affected by the electrical noise than the other types of transducers. Therefore, they can use in long distance applications more effectively. Previous studies show that researchers used the different types, numbers, and sensitivity ranges of the pressure transducer in their experimental setups to predict the sloshing loads acting in ship tanks. Pressure transmitters which have different sensitivity and output signal are compared in the experiment study to determine the optimum sensor types for sloshing applications.

Keywords: Pressure Transducer, Ship, Tank, Sloshing.

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EXPERIMENTAL INVESTIGATION OF THE SLOSHING UNDER VARIOUS SURFACE PARAMETERS

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Abstract:

Sloshing has a great concern for the LNG ships and also any fluid carried a tank with free surface. Rectangular tank partially filled by fluid is experienced to simulate sloshing phenomenon. The motion platform is used to perform the periodic motion at direction of sway. In order to examine the effect of different sloshing mode, various excitation frequencies are used. The behavior of fluids is captured by a camera thus different excited fluid effect on side walls could be tracked. The characterization of fluid is changed with filled level; hence four height level of fluid is selected for the tank. Interaction of fluid and tank side wall is investigated by image processing with comparing different excitation frequency and changing surface properties of a side wall. Hydrophobic coated is applied to increase the contact angle of water on surface which angle is changed from 90° to 160°. To measure impact pressure due to fluid sloshing, three pressure sensors are attached to side walls. Each experiment is repeated also for hydrophobic coated series. The main focuses of the experiments on the free surface deformation, fluid run-up and down on side walls, impact pressure at an uncoated and coated surface. Through detail captured images and measurements pressure, it is found that the effect of hydrophobic coated is changed the characteristics of free surface deformation and height of fluids rising up on side walls. The measured pressure values are also demonstrated that the impact is decreased and changed the shape and time at reaching pick value.

Keywords: Sloshing, Ship Tank, Pressure Measurement

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EFFECT OF V/III RATIO ON C-PLANE GAN LAYERS WITH TWO STAGES HT-GAN

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Abstract:

GaN-based materials are of great interest because of their potential applicability to produce devices such as high efficiency light emitting diodes (LEDs), laser diodes (LDs), and high-power and high-temperature devices. Although, it is difficult to grow high-quality GaN epilayers due to large lattice and thermal expansion mismatch between the sapphire substrate and the GaN epilayer, high efficiency blue light-emitting diodes (LEDs) were successfully produced. Even though nitride based devices are less sensitive to dislocations, dislocations acts nonradiative recombination centers or leakage pathways for vertical conduction, degrade device performances and cause lower lifetimes in GaN layer effect device performances. For this reason, several groups investigated the effect of growth parameters to improve quality of GaN epitaxial layer. The aim of this study is to understand the effects of different V/III ratio during 3D-2D transitions. A series GaN epitaxial layers were grown on c-plane sapphire substrates by MOCVD system. The effect of different V/III ratios in 3D-2D transition (during HT-GaN growth) on structural and optical properties are studied using high resolution x-ray diffraction (HRXRD), atomic force microscopy (AFM) and photoluminescence spectroscopy (PL).

Keywords: V/III Ratio, Gan, Mocvd

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EFFECTS OF CNT RATE ON THE IMPACT RESPONSE OF NANOPARTICLE REINFORCED GFRP TUBES

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Abstract:

In this study; the effect of the nanoparticle contribution rate on low velocity impact behavior of carbon nanotube added filament wound glass fiber reinforced plastic (GFRP) pipes was investigated. 0.5% and 1.0% multi walled carbon nanotubes (CNT) were added into the heated epoxy during the production of the tubes produced by the filament wound method at the winding angle of ± 55°. Pre-stress was created by applying internal pressure of 32 bar to pure, 0.5% and 1.0% carbon nanotube doped E-glass / epoxy composite pipe specimens. Low-velocity impact tests were applied to CNT-reinforced GFRP pipes under pre-stress at 10 Joule energy level. The contact force - time and force - displacement graphs are obtained as a result of the low-velocity impact experiments. In addition, damage zones in the damaged sample section were examined and the effects of nanoparticle reinforcements on impact response and damage mechanisms were evaluated at different ratios.

Keywords: Glass Reinforced Plastic, Carbon Nanotube, Low-Velocity Impact, Damage Behavior

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PREPARATION OF A NEW SMART POLYMERS FOR ALBUMIN ADSORPTION

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Abstract:

Environmentally sensitive smart hydrogels undergo a volume phase transition in response to a change in their environment such as temperature, pH, ionic strength, solvent and electric fields, and so on. Therefore, environmentally sensitive hydrogels can be used in many fields such as advanced material for biomedical, environmental, adsorption, catalysis, and sensor applications.

The aim of this work is to synthesize and characterize a new environmentally sensitive hydrogel for protein adsorption. Firstly, a new smart polymer was prepared using N-isopropyl acrylamide (NIPAM) for temperature sensitivity, aconitic acid (AA) for pH and ionic strength sensitivity and acrylamide (AAm) for mechanical strength. p(NIPAM-co-AAm)/AA hydrogel were prepared via free radical polymerization reaction in aqueous solution. The characterizations of the environmentally sensitive hydrogels were examined by Fourier Transform Infrared Spectroscopy (FTIR), thermogravimetric (TG), and differential scanning calorimetric (DSC) analyses. The swelling experiments as equilibrium swelling percentages by gravimetrically were carried out in different solvents, at different solutions temperature, pH, and ionic strengths to determine their effects on swelling characteristic of the hydrogel. The lover critical solution temperature (LCST) of the environmentally sensitive hydrogel was calculated. Finally, commercial human serum albumin adsorption on the hydrogels was examined, and the concentration, temperature and pH effects were investigated for adsorption. Also, albumin in human blood serum was used for the albumin adsorption. The amounts of adsorbed albumin were calculated. As a result, the swelling and protein adsorption behavior of environmentally sensitive hydrogel was found to change significantly with the effect of environmental conditions.

Keywords: Environmentally Sensitive Hydrogel, N-Isopropyl Acrylamide, Aconitic Acid, Swelling, Albumin, Adsorption

[*]*This study was supported by the Scientific Research Project Unit in Cumhuriyet University (F-133).*

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KINETIC INVESTIGATION OF SOME DIURETICS BY THERMOGRAVIMETRY

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Abstract:

Diuretics are a class of medications commonly known as "water pills." They're prescribed to treat high blood pressure; swelling of the feet, ankles, and lower legs and fluid in the lungs caused by heart failure; fluid buildup in the abdomen caused by liver damage or certain cancers; and eye conditions such as glaucoma. Other conditions that may be treated with diuretics include diabetes insipidus, polycystic ovarian syndrome (PCOS), kidney stones, male-pattern baldness in women, and osteoporosis.

There are several different classes of diuretics, each of which works differently in the kidneys to help rid the body of extra water and salt. Examples of diuretics include:

- Loop diuretics
- Thiazide diuretics
- Potassium-sparing diuretics
- Carbonic anhydrase inhibitors

Thermal analysis techniques cover all methods in which a physical property is monitored as a function of temperature or time.

Thermogravimetry are useful techniques that have been successfully applied to reveal important information regarding, the physicochemical properties of drug and excipient molecules such as polymorphism, stability, purity, formulation compatibility among others, and assessing the drug degradation kinetics. There are definitive advantages to employing thermal analysis methods to attain varying views of the physicochemical properties of pharmaceuticals. The determination of the key physical and chemical properties of a new material is essential. Therefore, the aim of this study was to evaluate the kinetics of a loop diuretic such as furosemide and a carbonic anhydrase inhibitor such as acetazolamide using thermogravimetry. The search of thermal degradation and kinetics were carried out to help understanding the solid-state characterization, evaluate the quality control and stability for diuretics.

Keywords: Diuretics, Thermogravimetry, Thermal Degradation, Kinetics

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DO MONOMERS USED IN POLYMERIC BIOMATERIALS EFFECT ON APOPTOSIS IN CEREBRUM?

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Abstract:

Biomaterials are mostly polymers and are used in artificial organ production in contemporary medicine. They are prepared by the polymerization reaction of many monomers. There are many monomers used in biomaterial production.

The aim of the present study was to investigate whether acrylamide, methacrylamide and N-isopropylacrylamide induce apoptosis in cerebrum.

The cellular process of apoptosis is an important component of tissue and organ development as well as the natural response to disease and injury. DNA fragmentation in neurons was characterized by double staining with terminal deoxynucleotidyl transferase mediated deoxyuridine triphosphate-biotin nick end labeling (TUNEL).

Following the intramuscular injection of aqueous solutions of monomers that are prepared in certain concentrations to animals, desired tissues obtained after four weeks is fixed in 10 % buffered neutral formalin. Quantitative analysis of apoptotic cells was evaluated used by Olympus cells dimension software. A small number of TUNEL positive cells detected in control group whereas many cells were intensely stained in the tissues obtained from acrylamide, methacrylamide and N-isopropylacrylamide applied groups.

In conclusion, the monomers used in biomaterial production seemed to affect the cell viability.

Keywords: Biomaterial, Cerebrum, Apoptosis, TUNEL Method, Olympus Cellsens Dimension Software

[*]This study was supported by the Scientific Research Project Unit in Cumhuriyet University (T-686).

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DOES DIABETES AFFECT APOPTOSIS AND CELL DIVISION IN RAT BRAIN TISSUE?

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Abstract:

Diabetes is a common disease in the world and affects the quality of life of the patients negatively. Diabetes is known to be associated with neurological diseases such as peripheral nerve diseases, stroke and dementia. Although the mechanism of diabetic brain activation is not fully elucidated, changes in vascular structure, insulin resistance, glucose toxicity, oxidative stress, accumulation of end-products of glycolysis, hypoglycaemic episodes and changes in amyloid metabolism are thought to be effective.

It is aimed to investigate the apoptosis and cell division in the diabetic rat brain tissue. After 30 days from the administration of streptozotocin (STZ; Sigma Chemical Co., St. Louis, Missouri, USA) intraperitoneally (60 mg / kg va) to induce diabetes, diabetic and non-diabetic rats were administered 200 mg / kg sodium pentobarbital intraperitoneally euthanasia was done. Routine tissue follow-up protocols were applied to brain tissues after death for immunohistochemical examinations. Caspase 3 and 7 were used for apoptosis activity and Ki 67 was used for mitotic activity. In the experimental group, the number of caspase positive cells was significantly higher than in the control group. Ki 67 immunolocalization was increased in the experimental goup compaired with control group. In the present study, the caspase 3 and 7 staining results suggested that apoptosis may serve as the primary mechanism underlying injury to the cerebral cortex induced by diabetes mellitus. Caspases are a family of specific cysteine proteases that are essential for apoptosis. In conclusion, diabetes promoted apoptosis and increased cell proliferation in cerebrum and it may be disturb brain functions and homeostasis.

Keywords: Diabetes, Brain Tissue, Apoptosis, Caspase 3, Caspase 7, Ki 67.

[*]This study was supported by the Scientific Research Project Unit in Cumhuriyet University (T-760).

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THREE-PHASE PARTITIONING AND CHARACTERISATION OF MILK-CLOTTING PROTEASES FROM OSAGE ORANGE (MACLURA POMIFERA)

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Abstract:

Proteases, which hold the first place in the world market of enzymes, play an important role in industry. Especially in food industry, they are frequently used in different productions. For millen-nia milk-clotting enzymes, which are preparations of proteases, have been used in cheesemaking and they seem to be the oldest known application of enzymes. Milk coagulation is a basic step in cheese manufacture and is a result of the action of proteases that destabilize casein micelles. Recently attention has been focused on the production of milk-clotting enzymes with appealing physicochemical properties. Three-phase partitioning (TPP) is an elegant, modest and relatively new bioseparation strategy to separate and enrich various biomolecules including proteins, enzymes, enzyme inhibitors, oils and carbohydrates from plants, animals and microorganisms. TPP has several advantages in comparison to traditional extraction and separation techniques like; rapid, efficient, economical, green and scalable. It has been used both upstream and downstream separation process and generally been used as a single step protocol.

The present study describes for the first time, the purification and characterization of proteases from a crude extract of Maclura pomifera using the TPP system. Hence, the main focus of the study was to achieve a maximum purity and yield of proteases using this one-step purification approach. The influence of various parameters such as crude extract to t-butanol ratio, pH and (NH4)2SO4 saturation on purification of proteases has been studied to achieve the highest yield and purity fold. Optimal purification parameters of the TPP system are determined as 40% (w/v) ammonium sulfate concentration with 1:1 (v/v) ratio of crude extract to t-butanol at pH 6.0. This optimized TPP system gave 1.4 purification fold with 86% recovery of proteases. Characterization and stability of the proteases were also investigated. Beside of their caseinolytic activity the milk-clotting activity was determined.

Keywords: Protease, Osage Orange, Maclura Pomifera, Three-Phase Partitioning, TPP, Purification.

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EXTRACTION AND PURIFICATION OF BLACK MULBERRY ANTHOCYANINS WITH AQUEOUS TWO-PHASE EXTRACTION (ATPE) SYSTEM

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Abstract:

Colour is one of the most important attributes of foods, being considered as a quality indicator and determining frequently their acceptance. Nature produces a variety of compounds adequate for food colouring, such as; anthocyanins, betalains, carminic acid, carotenoids and chlorophylls. Anthocyanins have been the focus of considerable interest within the food industry recently because of their potential application as natural colorants and nutraceuticals. They have also play a vital role in the prevention of neuronal and cardiovascular illnesses, cancer and diabetes due to their antioxidant property. Despite the great potential of application that anthocyanins represent for food, pharmaceutical and cosmetic industries, their use has been limited because of their relative instability and low extraction percentages. Commercial recovery of anthocyanins from plants usually use solvent extraction after homogenization. For food industry the extraction with ethanol is preferred due to the its non-toxic property. Aqueous two-phase extraction (ATPE) is an alternative method with various advantageous for concentration and purification of industrially important biomolecules. As a primary separation method, ATPE has been widely applied for the recovery of biological products due to its easiness for scale-up, high capacity and yield, low cost and short processing time.

In order to extract and concentrate black mulberry anthocyanins an economic and effecient aqueous two-phase extraction system containing ethanol/ammonium sulfate was developed. The influence of various parameters such as (NH4)2SO4 concentration, pH, ethanol and crude extract amount on extraction of anthocyanins has been studied to achieve the highest yield. Optimal extraction parameters of the system are determined as 22% (w/v) ammonium sulfate, 26% (v/v) ethanol, 10% (v/v) crude extract and pH 3.6. With this optimized system anthocyanins were extracted at the top ethanol phase with 67% yield. The total sugar, flavanoid, phenolic and anthocyanin content of both bottom and top phases were also determined.

Keywords: Anthocyanin, Black Mulberry, Colourant, Aqueous-Two Phase Extraction, Atpe

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INTERACTIVE SEARCH ALGORITHM FOR SOLVING THE MECHANICAL AND STRUCTURAL OPTIMIZATION PROBLEMS

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Abstract:

Generally, in the all fields on science and engineering finding the optimum state for a desired system can be considered as the final goal of the design process. The main goal(s) of an optimization process is defined through the proper mathematical function so-called objective function. To achieve the optimal state this function should be mathematically minimized or maximized. To meet this aim two different approaches can be applied as optimizer tools. Gradient based and non-gradient based methods. Gradient based methods utilize the gradient of the objective function to find the proper direction to move toward the optimal point. In spite of these methods are fast and reliable, they have two main drawbacks. First they need a continuous or at least partly continuous objective functions. Second, their final solutions are very sensitive the initial condition. On the other words in their start from a vicinity of the local optima, easily can trapped into local minima/maxima. Also, in several engineering problems finding the continuous objective function for the proposed problem is so difficult or even impossible. Due to this reasons the flexible numeric methods seems to be required to solve this kind of problems. In this regard the metaheuristic techniques are developed and widely used in the last decades. These methods mimic the behavior of the birds, bees and fish colonies in finding food sources or imitate a physical principle or simulate the social behavior to provide a mathematical model using as an optimizer tool. Metaheuristics are non-gradient based approaches, so they do not require any continuous objective function and/or its gradients. They are population based methods which numerically but based on the certain algorithms explore the search space. One of the main drawbacks of these methods is to unable to provide a proper balance between local and global search strategies. So they can easily be trapped into a local optimum (i.e. due to lack of global search capacity) and/or find the optimal solution in considerably low convergence rate (i.e. due to lack of local search capacity). To mitigate this drawback and provide more proper balance between exploitation and exploration abilities of the metaheuristics, in the current study the newly developed integrated particle swarm optimizer (iPSO) is modified and combined with learning phase of the teaching and learning based optimizer (TLBO) and the new method is named as interactive search algorithm (ISA). The proposed method hybridizes the affirmative specifications of its both parental methods and provide a proper balance between exploration and exploitation abilities via a tendency factor. The proposed method is tested on some mathematical and structural optimization benchmark problems. The obtained outcomes reveal that the new algorithm is competitive with other well-stablished metaheuristic algorithms.

Keywords: Integrated Particle Swarm Optimizer (Ipso), Teaching And Learning Based Optimizer (TLBO), Hybrid Techniques

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COMPARISON OF SINGLE-PHASE AND DOUBLE-PHASE METAHEURISTIC ALGORITHMS

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Abstract:

Generally, optimization techniques are divided into two main groups: gradient based and non-gradient based methods. Although gradient based methods have rapid convergence rate, they require a continuous objective function and its gradients. Providing such an objective function is so difficult or even impossible for several engineering problems. Consequently, since metaheuristic techniques don't require any continuous objective function, they are broadly used for solving many different types of complex optimization problems. Despite of these techniques (i.e. metaheuristics) can be assessed from different points of view, in this investigation the effect of the number of phases of the algorithm on the optimization process is taken into account.

To meet this aim, two different metaheuristic approaches as teaching and learning based optimizer (TLBO) and Jaya optimization methods are selected. TLBO simulates the knowledge exchange process between teacher and students in the class room to find an optimal solution. This method contains two different phases: teaching phase and learning phase. In each iteration each agent twofold evaluated by TLBO algorithm, one in the teaching phase and the other on the learning phase. So, since in each iteration the objective function is evaluated twice per each agent, this algorithm is classified as the double-phase algorithm. On the other hand, since Jaya evaluates each agent just once in each iteration, it is selected as single-phase algorithm.

Both cited algorithms are verified on the optimization problems. The constrained and non-constrained problems are selected as comparative benchmark problems. So, both algorithms are tested on different type of problems. The outcomes show that for simple problems (i.e. problems with simpler domains), both algorithms demonstrate nearly the same performance while on more complex problem the convergence rate of Jaya is faster while the final solution of found by TLBO is more accurate.

Keywords: Metaheuristic Techniques, Jaya Optimization Method, Teaching And Learning Optimization Method

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DESIGN OF FUZZY LOGIC CONTROLLER FOR DYNAMIC STATE VARIABLES OF A FIXED WING UAV

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Abstract:

Fuzzy logic control technique is one of the modern control methods for decision making of the systems. By using fuzzy logic approach, many different decision options can be applied to the systems. However, this approach needs some knowledge about the system conditions. In this conference paper, fuzzy logic controller approach is applied to a fixed wing (Ultrastick-25-e) unmanned aerial vehicle (UAV) which exists in the literature and aerodynamic parameters needed for dynamic equations are obtained from the literature. According to different fuzzy rules and membership functions, fuzzy inference system is obtained for different aircraft dynamics such as roll, pitch, yaw and altitude etc. characteristics. Responses of the dynamic state variables and their outputs are investigated individually by using transfer functions and fuzzy logic rules. In this analysis, gust disturbance is not taken into account for UAV dynamic equations in this level of analysis. Obtained results will be compared to previous and future studies of UAV control.

Keywords: Fuzzy Logic Controller, Fixed Wing, Unmanned Aerial Vehicle, Fuzzy Rules.

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LATERAL AND LONGITUDINAL DYNAMICS CONTROL OF A FIXED WING UAV BY USING PID CONTROLLER

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Abstract:

Unmanned aerial vehicles (UAV) are taking more attention in both civilian and army applications in the world. One of the most important thing in UAV applications is to make an autonomous, fast and stable control of a UAV. In this study, one of the fixed wing UAV model (Ultrastick -25e) is analyzed and aerodynamic parameter coefficients of the UAV model which needed for dynamic equations are acquired from literature. For that reason, firstly, as a classical control techniques of a fixed wing UAV, PID controller is applied and transfer functions of different state variables are derived by using state-space model. PID gains of state variables according to different control inputs are obtained by using Matlab tuning and Ziegler-Nichols methods. Optimum PID gains, rise time, settling time, peak overshoots of the roll, pitch and yaw dynamics are obtained. Future studies will give a chance to compare classical PID controller results and modern control techniques in terms of altitude, roll and heading angle controller of the UAV model.

Keywords: PID Controller, Fixed Wing, Unmanned Aerial Vehicle.

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IMMUNOSTIMULATION OF NON-SPESIFIC IMMUNE SYSTEM IN GILTHEAD SEABREAM BY A GEOPHYTE PLANT, URGINEA MARITIMA

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Abstract:

In this study, effects of Urginea maritima (L.) Baker. (commonly is known as sea squill) on non-specific immune response of gilthead seabream, Sparus aurata (L. 1758) were investigated by determination of some changes on immuno-hematological parameters. The plant was collected in Mugla region-Turkey and its bulb was extracted in ethanol. The plant extract in PBS applied into fish by intraperitoneal injection at doses of 0.5 mg per fish and 2 mg per fish. Post injection on the 1st, 7th, 14th, 21st and 28th days, five fish were randomly chosen from each group and anesthesized. The blood samples were taken by cutting the tail off. All doses of plant extract which were tested significantly enhanced the Nitro blue tetrazolium (NBT) positive cells, serum lysozyme, total number of leukocytes, leukocyte cell type percentages on the day 7th, 14th and 21st in fish. The applied dosages of sea squill extract were showed that non-specific immune system of sea bream gained activity and this effect was lasted up to third week. The results of this study clearly demonstrated that the sea squill has an immunostimulatory activity on nonspecific immune system of sea bream. There is a need further studies on using the plant extract as feed additives in fish. It could be also suggested to use for prophylactic purposes in aquaculture.

Keywords: Sea Squill, Immunostimulant, Fish, Blood,

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EVALUATION OF SOME NATURAL PRODUCTS ON NON-SPECIFIC IMMUNE RESPONSE OF RAINBOW TROUT (ONCORHYNCHUS MYKISS)

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Abstract:

The main objective of this review is to provide an information on current studies cope with the use of natural products in farmed rainbow trout (Oncorhynchus mykiss). Rainbow trout is one of the most cultured freshwater fish species all over the world. We would like to emphasize the some natural products; such as plant, mushroom, yeast, algae and their extracts which have been reported to have immunostimulant effect on the non-specific immune response in rainbow trout. In general, these products have not caused residue problems and safe to use for keeping the fish healthy in culture condition. They also have degradable compounds which didnot cause negative impact on the environment. The effects of the natural products on non-specific immune response of rainbow trout (Oncorhynchus mykiss) have been reported by using Lentinula edodes (shiitake mushroom), Pleurotus ostreatus (oyster mushroom), Spirulina platensis (algae), Lupinus perensis (lupin), Mangifera indica (mango), Urtica dioica (nettle), Nigella sativa (black cumin), Zingiber officinale (ginger), Camellia sinensis (green tea), Saccharomyces cerevisiae (yeast) , Allium sativum (garlic) and so on. In conclusion, natural products could be use in aquaculture for the stimulation of non-spesific immune response, promote to growth of fish and the prevention of diseases. Also, they could be potential alternative to antibiotic and other chemotherapeutic drugs in rainbow trout culture.

Keywords: Fish, Freshwater, Mushroom, Yeast, Algae, Health

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RECIPE OPTIMIZATION FOR SYNTHESIS OF ZNO AND AL2O3 THIN FILM BY USING ATOMIC LAYER DEPOSITION

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Abstract:

Developments in microelectronics and thin film devices require the advancement of new materials and new deposition methods. In particular, the driving role of some devices, such as silicon devices, will require SiO2 transition oxide layers with a thickness of several nanometers in the near future. Similarly, recipe optimization for synthesis of ZnO and Al2O3 or other thin films in atomic layer deposition technique has also impotant. In this Study, Zno and Al2O3 thin film were deposited at 200 ◦ C on silicon substrates with atomic layer deposition (ALD) technique. The study was repeated ten times with different parameters. The thicknesses of the films were measured with an ellipsometer to determine whether they were homogeneous or not. XRD pattern of thin film in which is determined to be homogeneous was investigated and its crystal structure was determined and its electrical properties were characterized. Optimum recipe for atomic layer deposition of ZnO and Al2O3 were optimized.

Keywords: Zno, Al2O3, ALD, Thin Film,

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ADSORPTION OF METHYLENE BLUE ON MESOPOROUS NANO SILICA OBTAINED FROM QUARTZITE

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Abstract:

Due to rapid growing in the textile industry, in recent years, dyes contamination of surface and subsurface water sources has been major problem, since many dyes are not biodegradable and tend to accumulate in living organisms causing various diseases and disorders. In order to remove the toxic dyes from waste water, many researches on synthesis of porous materials have been conducted. In the present study, mesoporous nano amorphous silica was prepared using quartzite by leaching process to remove the Methylene Blue from waste water. The chemical structure, surface property and morphological properties of the nano amorphous silica were determined by XRD, IR, SEM, EDX and BET. The characterization studies indicated that the high purity of nano silica was successfully obtained from quartzite with a remarkable surface area (348.56 m2/g). In the adsorption studies, the adsorption isotherm data were better fitted by Langmuir model and the main adsorption mechanism between the dye and nano silica was defined as electrostatic interaction.

Keywords: Nano Silica, Mesoporous, Methylene Blue, Adsorption

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THE GENERAL CHARACTERISTICS OF PIGEONS RAISED IN TURKEY AS REGARDS CLASSIFICATION CATEGORIES

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Abstract:

Pigeon is a poultry species that has been reared since ancient times in the world, is appeared in mythology and different religions, and generally symbolizes peace. Although there are different types of classification by different researchers, pigeons are usually classified as performance (fleet flyer, tumbler, roller, diver, homing, turner, high flyer, pigeons performing long-term or short-term flight, sound) or ornamental (game birds). While the fleet pigeons are described by collective flying in the sky, tumbler and roller pigeons are known specific fly with acrobatic movements (rollers descend from the air while tumblers roll-up as they ascend high). Homing pigeons are defined by their ability to return where they are raised from where they are taken. Diver pigeons are defined by the fact that when they reach a certain height, they dive immediately to the set with the light shown below. The greatest features of high flying pigeons are that they are too long to stay so that the flapping of the wings in the air is not noticeable. The sound pigeons are known for their crowing ability to replace the appearance and flying abilities. Ornamental pigeons are characterized by their external appearance (cunning, hinting, cap, color, sighting features...). Besides, it is also found in pigeons grown for consumption as human food. Despite the small number of articles about pigeon breeding for many years in Turkey, in this study, the information about the general characteristics of this pigeon classified were reviewed.

Keywords: Pigeon, Performance, Classification, Ornamental, Breeding

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DETERMINATION OF MORPHOLOGICAL CHARACTERISTICS OF ADANA PIGEONS IN PROVINCE OF MERSIN

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Abstract:

The aim of this study was to determine some morphological characterisrics of Adana pigeons (diver pigeons) in province of Mersin, in Turkey. Diver pigeons are defined by the fact that when they reach a certain height, they dive immediately to the set with the light shown below.The study was conducted with 104 pigeons (including 52 males, 52 females) reared in five different enterprises in 2018. Pigions were examined in some morphological parameters (coat colar (black, blue, red, white) ,iris color (hazel, orange yellow, green, blue, brown) the number of wing ((PAS) (9-1-12)) and non feather tarsi, have a dewlap) and some morphometric measurements (body weight, lenght, trunk lenght, right wing lenght, and lenght, tail lenght, thoracic perimeter, chest width and depth, head lenght and width, bill lenght and depth, tarsus diameter).The effect of the age on bill lenght, chest width and circumfirence (P<0,001), tail lenght, head width (P<0,05) and the effect of the gender head lenght and width, beak depth, chest circumfirence, right wing lenght (P<0,001), bill lenght, body weight, tail lenght, tarsus diameter (P<0,01), trunk lenght, chest depth (P< 0,05) were found to be significant. In conclusion, Morhological measurements of this pigeons were found higher values than other studies on performance pigeons in Turkey.

Keywords: Adana Pigeon, Body Weight, Diver Pigeon, Mersin, Morphological Characteristics

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EVALUATION OF OVARIAN FOLLICLE DIAMETERS IN DIABETIC RATS

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Abstract:

Diabetes mellitus is a metabolic disease that affects protein, fat and carbohydrate metabolism, caused by insufficiency of pancreatic insulin secretion and/or impaired of tissue response to insulin. Ovaries undertake the task of synthesizing and releasing hormones in the steroidal structure through the production of gametogenesis. The development of follicles in the ovaries with indispensable value in the breeding of the reproductive function in the mammals produces the ovum with the ability of fertilization from one side and the simultaneous changes and developments in certain regions of the reproductive system from the other side. Diabetes is known to impair oocyte development as well as oocyte quality. In particular, it has been shown that oocyte mitochondria of experimental diabetic mice are dysfunctional. In experimental studies, it is thought that N-nitroso derivative D-glucosamine-based STZ, which is used to produce human-like diabetes, selectively destroys the islets of langerhans by forming oxidant substances and to induce diabetes by giving inappropriate nitric oxide responses. For this purpose, 50 adult female Wistar rats that weigh between 250-300 grams were used in this study. Streptozotocin was administered to induce diabetes in animals. Animals treated with streptozotocin were euthanized by intraperitoneal injection of 200 mg/kg pentotal sodium 30 days later. Routine protocols were applied to morphological examinations of post-mortem ovarian tissues of diabetic and non-diabetic rats.

The diameters of each of the follicles of the ovarium tissues were measured individually using a program called Zen on a Zeiss Axiocam microscope, followed by a statistical analysis using the statistical Spss program. According to this work, primordial, primer, secondary follicle and corpus luteum diameters were not much different but we found that there is more significant difference in the graafian follicles and we think that this is due to the fact that diabetes adversely affects the ability to develop oocyte quality.

Keywords: Diabetes, Ovarian Follicle, Rat, Ovary

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IMPORTANCE OF PROLIDASE ENZYME IN CARDIOVASCULAR DISEASES

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Abstract:

Prolidase enzyme is an enzyme that hydrolyzes the peptide bond of imidodipeptides (X-Pro, X-Hydroxyproline), including proline or hydroxyproline at the carboxyl terminal position. In this study, the relationship of cardiovascular diseases on prolidase enzyme was aimed. Prolidase enzyme has been found in many human and animal cells. Prolidase enzyme also plays an important role in the catabolism of prokaryotic, collagen and proline or hydroxyproline inducing enzymes in the cell. In the absence of the prolidase enzyme, some rare inherited autosomal recessive inherited diseases have been identified. In the studies performed, the symptoms of this disease are highly variable, and chronic recurrent infections, mental retardation, splenomegaly and skin lesions can be seen. cardiovascular diseases have become one of the world's leading health problems in developed countries, particularly in diseases and deaths worldwide. In this study, the relation of prolidase enzyme with cardiovascular diseases was investigated.

Keywords: Prolidase, Enzyme, Cardiovascular Diseases

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INVESTIGATION OF ADENOSINE DEAMINASE, ARYL ESTERASE AND PARAOXANASE-1 SERUM ACTIVITIES IN PATIENTS WITH BREAST CANCER

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Abstract:

Objective: In this study, some antioxidant enzyme activities arylesterase and paraoxonase-1 (ARE and PON-1) and adenosine deaminase (ADA) activity which is an important key in Purin biosynthesis, were determined from the serum samples that are taken from patients diagnosed with breast cancer in Oncology Department of Medical School of Yuzuncu Yil University. Material and Methods: In this study, the enzymes such as PON-1 ARE and ADA were determined by the spectrophotometric method. Results: The PON-1 activity of patient group (at phase-1, phase-2 and phase-3) was found significantly more lower than the healthy control group in breast cancer patients ($p<0.001$). The serum ARE activity (at phase-1, phase-2 and phase -3) was found significantly more lower to control group in this thesis study ($p<0.001$). And then in this study ADA activity was detected high in patient groups (at phase-1, phase -2 and phase -3) ($p<0.001$). Conclusion: As result, having a high level of PON-1 activity can be assessabled as a factor that reduces the risk of cancer that will be done.

Key words: Breast Cancer, ADA, ARE, PON-1.

Keywords: Breast Cancer, Ada, Are, Pon-1.

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THE EFFECTS OF DIFFERENT CRYOPROTECTANT ON THE POST-THAW SPERMATOZOA MOTILITY RATE AND MOTILITY DURATION IN CAPOETA TRUTTA (H., 1843) SPERM FREEZING

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Abstract:

There are some dominant fish species in Ataturk Dam Lake and longspine scraper (Capoeta trutta H., 1843) is one of them. The aim of this study is to examine different cryprotective agents on the cryopreservation process of longspine scraper. This study is performed to determine some of sperm quality after applying freezing / thawing process. The semen of C. trutta which is widespread distribution in Turkey, Iran, Iraq and Syria, and consumed as food plentiful is frozen. The changes in post-thaw motility rates of cryopreserved C. trutta sperm using three different cryoprotectants were investigated. Post-thaw spermatozoa motility rate was 73.75 ± 4.55% in methylglucol (MG2CH3O (CH2)2OH) and 60.58 ± 3.26% was used in methanol (CH3OH) as cryoprotectant. However, 81.25 ± 2.39% of motility rates were obtained in the samples using DMSO (CH3)2SO). We can conclude that when C. trutta sperm is cryopreserved, the most suitable option for the use of DMSO at pH 7.2 for the highest spermatozoa motility rate and duration is considered appropriate.

Keywords: Sperm Freezing, Osmolality, Extender, Cryoprotectant, Sperm Quality

[*]This study has been supported by the Harran University Scientific Research Projects Coordination Unit. Project Number: 13046.

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DETERMINATION OF SEASONAL FLORFENICOL RESIDUE LEVELS IN THE TROUT FACILITY IN KARKAMIS DAM LAKE, SANLIURFA

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Abstract:

This study was aimed to detect florfenicol (FF) and its main metabolite florfenicol amine residue at edible tissue samples (muscles) and to assess the results in terms of food safety and public health. In this study, a total of 10 trout were used from one trout facility located in the Karkamis dam lake in Sanliurfa-Gaziantep borders. Florfenicol residues in trout muscles were determined using high-performance liquid chromatography with a regulatory surveillance purpose. In the samples taken from trout muscles, the level of florfenicol changed seasonally. It was found significantly higher in winter than other seasons (0.0609 ± 0.003 p> 0.001). According to the Turkish Food Codex, the maximum residue limit of florfenicol and the most important metabolite, florfenicolamine, in fish muscle is 1000 µg / kg. In previous studies it was determined that 65% of the total amount was metabolized to florfenicol and 35% to florfenicolamine. In this study, only florfenicol levels were determined in fish muscles and its metabolite florfenicolamine was not analyzed. Thus, in the results of florfenicol residues, 35% of the metabolite amount is not found. However, the level of florfenicol residue determined in fish muscles is well below the TGK limits. These results indicate that there is an increase in fish bacterial diseases due to the effects of the reproductive period and other stress factors in winter. Accordingly, the US Food and Drug Administration (FDA) has approved for use in fish diseases, indicating that florfenicol is more commonly used by fish farmers for treatment and protection against fish diseases.

Keywords: Florfenicol, Season, Residue, Dam Lake, Turkiye

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BINDING ENERGY AND OPTICAL ABSORPTION OF DONOR IMPURITY STATES IN TUNED DOUBLE QUANTUM WELL UNDER THE EXTERNAL FIELDS

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Abstract:

We have investigated the binding energies of the ground and first excited donor impurity states and the total absorption coefficient, including linear and third order nonlinear terms for the transitions between 1s and 2s electron-impurity states in tuned double quantum well consisting of asymmetric wells as a function of the impurity position, well width, the electric and magnetic field intensities. The obtained results show that the binding energies of 1s and 2s donor impurity states and total absorption coefficient for the transitions between the related impurity states are sensitive to the structure parameter, the electric field strength-F, and impurity position. By changing these parameters, the peak amplitudes and the location of the peak positions can be changed accordingly and also the electronic and optical properties of tuned double quantum well can be adjustable by an appropriate choice of the sample geometry, material parameters and applied external fields which will lead to new potential applications in optoelectronics. The binding energies were obtained using the effective-mass approximation within a variational scheme and the optical transitions between any two impurity states were calculated by using density matrix formalism and the perturbation expansion method.

Keywords: Double Quantum Well, Impurity Binding Energy, Optical Transitions

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OPTICAL PROPERTIES OF TUNED DOUBLE QUANTUM WELL UNDER THE ELECTRIC FIELD

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Abstract:

In this study, the effects of the electric field and the structure parameter on the total absorption coefficient and refractive index changes including linear and third order nonlinear terms for the optical transitions between three lower-lying electronic levels of the electron confined within the tuned double quantum well have been investigated. Energies were obtained using the effective-mass approximation and the optical transitions were calculated by using density matrix formalism and the perturbation expansion method. Obtained results show that the red or blue shift in the peak positions of total absorption coefficient and the refractive index are observed by varying the electric field strength and the structure parameter. In the absence of the electric field the forbidden intersubband optical transitions become allowable and intersubband Stark shift is observed (quantum confined Stark effect) when the electric field is applied. These results can be used to adjust and control the optical properties of the structure.

Keywords: Tuned Double Quantum Well, Optical Transitions, Electric Field

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OPTICAL PROPERTIES OF GAAS/GAALAS MULTIPLE QUANTUM WELLS UNDER THE EXTERNAL FIELDS

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Abstract:

In this study, we have investigated the effects of the well parameters (Lw well width, Lb barrier width), applied the external electric and magnetic field strengths and direction of the magnetic field (tilt angle) on the electronic and optical properties of the GaAs/GaAlAs multiple quantum wells are investigated. The energy levels and wave functions of the system are calculated by using the transfer matrix method within the effective mass approximation and the compact density-matrix approach is used for the optical transitions (linear, nonlinear and total absorption coefficients) between two low-lying electronic energy levels. Our results show that the electronic and optical properties of the system are sensitive to the applied external field strengths and the magnetic field direction. Therefore, we can conclude that the effects of the applied external fields and the tilt angle (magnetic field direction) can be used to adjust and control the optical properties of the system to our purpose.

Keywords: Multiple Quantum Wells, Optical Properties, Tilted Magnetic Field, Electric Field

[*]*Cumhuriyet university (CUBAP)*

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ENCAPSULATION OF CURCUMIN AND GEMCITABINE INTO O-CARBOXYMETHYL CHITOSAN NANOPARTICLES AND INVESTIGATION OF THEIR CYTOTOXICITIES

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Abstract:

Curcumin is a hydrophilic polyphenol compound obtained from turmeric. Gemcitabine (dFdC) is an analog of deoxycytidine used against various types of cancer. Nanoparticles are used in drug delivery systems for a long time due to being the non-specificity, low systemic solubility, and systemic toxicity of chemotherapeutic agents used in cancer treatment. Chitosan is a natural polymer, and often preferred in the synthesis of nanoparticles having many good properties such as not showing toxic effects, biocompatible, easily degradable and antibacterial. However, it possesses low solubility in the physiological pH. In this study, the solubility of the chitosan increased by derivatising chitosan to O-Carboxymethyl chitosan(O-CMC). Also, modification of O-CMC was defined with FTIR analysis. O-CMC nanoparticles were formed via the ionic gelation method. The O-CMC suspension was prepared in the aqueous medium and respectively loaded with gemcitabine and curcumin. As a result of the ionic interaction with the addition of the calcium ion into the mixture which contains gemcitabine and curcumin, drug loaded O-CMC nanoparticles were obtained. The concentration of curcumin was studied at different concentration values to calculate drug encapsulation yield and the optimum concentration was determined. To determine the anticancer activity of the synthesized nanoparticles, MTT application was performed as a cytotoxicity assay on SKOV3 cells and IC50 values were determined. According to the results, the IC50 value of free gemcitabine represented a lower dose effect than curcumin. The IC50 value of the nanoparticles in the drug encapsulation was found as 44.18 µg / ml for the 48 h. and 12.72 µg / ml for 72 h. In conclusion, curcumin and gemcitabine loaded O-CMC nanoparticles were achieved drug release in a controlled manner compared to free drugs.

Keywords: Cancer Treatment, Nanoparticles, Curcumin, Gemcitabine, O-Carboxymethylchitosan

[*]*This study is supported by Ozel Ege High School, Izmir, TURKEY*

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CONJUGATION OF DOXORUBICIN VIA GLUTARALDEHYDE ONTO AMINE COATED MAGNETIC NANOPARTICLES FOR PH RESPONSE CANCER THERAPY

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Abstract:

Cancer is a major cause of death in developing countries. Ovarian cancer is responsible for many deaths, because in woman, it does not show any symptoms in first stages of cancer and it can be diagnosed in the third stage. Doxorubicin is a chemotherapeutic agent that induces cell apoptosis by DNA damage in the treatment of various types of cancer, including leukemia, breast, uterus, ovarian and lung cancers. This agent causes cardiac toxicity in the treatment process, so transportation of it into the target cancer tissue with drug delivery systems is necessary. Nanoparticles are one of the drug delivery systems which can be designed at the desired nanoscale sizes and can be derivatized with surface modifications. Drug-loaded nanoparticles are able to effectively penetrate capillary vessels of cancerous tissue with enhanced permeability and retention (EPR) effects and increase drug accumulation in target sites. Magnetite (Fe3O4) nanoparticles are targeted to tumor region by the magnetic field and materials such as phosphonic acid, gold, carboxylic acid are used for surface modification which can achieve stabilization.In our study, surfaces of synthesized magnetite nanoparticles were derivatized with 2-amino phosphonic acid and the characterization of nanoparticles was done by FTIR analysis. The forming amide groups bind to the glutaraldehyde cross-linked and mediate the linkage of the doxorubicin to the nanostructure. Taking advantage of the breaking ability of imine bonds at low pH, it has been aimed that Doxorubicin conjugated to nanoparticles can only affect cancer cells instead of normal cells. The cytotoxicity study was done on SKOV3 ovarian cancer cell line using by MTT assay. After 72 hours, IC50 values for free doxorubicin and doxorubicin bound to aminated magnetite nanoparticle were found 0.2780 µg / ml and 0.8993 µg / ml, respectively. As a result, the drug was released in a controlled manner for 72 hours.

Keywords: Cancer Treatment, Nanoparticles, Doxorubicin, Magnetic Nanoparticles, Ph Response Cancer Therapy

[*]*This study is supported by Bilfen School, Izmir, TURKEY*

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LIFT ACTUATOR CONNECTION POINT OPTIMIZATION ON TELESCOPIC ARM OF TELEHANDLERS

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Abstract:

In today's telescopic handlers and telehandlers machines, there are many different mechanisms that drive the telescopic arm. For example, it is possible to drive with a single hydraulic cylinder and a double hydraulic cylinder operating in parallel. Depending on the position of the connection points on the fixed arm of these cylinders changes can occur in the configuration. These structures are made to use energy as efficiently as possible. However, due to the location of the connection points of the hydraulic cylinder used to lift or lower the telescopic arm connection point, the telescopic arm connection to the main body and space constraints, problems are encountered in converting the generated energy to work. In this study, a connection point optimization has been made to ensure that the hydraulic cylinder used is particularly effective when used to lift the load, especially when the telescopic loader arm is in its lowest position. Obtained results and effects on load lifting performance of connection points are presented.

Keywords: Telescopic Loaders, Lifting Performance, Connection Point Optimization

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INNOVATIVE PRODUCT DESIGN USING THE FUNCTIONAL ANALYSIS AND TRIMMING METHOD

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Abstract:

In today's challenging and tough competition conditions, companies need to have an innovative product development capabilities. In this study, function analysis and pruning will be mentioned which will contribute to the ability of companies to develop innovative products. The function analysis involves visually expressing interaction relationships between all components of a product. The pruning is the process of using existing or other resources in the system to access the ideal final result by removing, replacing or creating variations of the original system in a function model. By applying this analysis and methodology, it is possible to circumvent the patent, even if alternative products or existing products are protected by the patent to an existing product. In this study, it is mentioned that an innovative product development approach will be presented by performing a function analysis by taking a sample product and then applying a pruning method by using real approved patent.

Keywords: Function Analysis, Pruning, Circumvent The Patent

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A VISUAL ANALYSIS OF WATER CORRIDOR BY USING PANAROMIC IMAGES: A CASE OF DUZCE ASAR STREAM

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Abstract:

With rapid urbanization, cities, citizens and natural areas within the city began to be under pressure. One of these areas is water corridors which are important parts of the landscape. One of the most important effects of these areas on society is visual value. In the studies of landscape architecture, to the identification, analysis and evaluation of an area, it is necessary to evaluate the visual data of the landscape differently from botanical and ecological sciences.

This study aims to reveal the visual landscape value of landscaping parts which vary along the urban water corridor. In this context, 28 different panoramic photographs were taken along the Duzce Asar Stream. The photographs were subjectively subjected to silhouette analysis according to visual (pattern, scale, texture, color, complexity, distance, unity, form, closeness, visual dynamics) and perceptual (security, impulse, comfort, satisfaction) parameters which have an important role in determining the visual integrity of the landscape. Correlation analysis was applied for evaluation of visual quality parameters. In addition, one way ANOVA was used to reveal the relationship between perceptual parameters and visual parameters.

As a result, the visual landscape value has been revealed along the urban water corridor and it has been determined how the visual effect changes at the perceptual level depending on the visual parameters.

Keywords: Duzce Asar Stream, Perceptual Parameter, Silhouette, Visual Parameter

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THE CONCEPT OF GREEN INFRASTRUCTURE AND URBAN FORESTS ON THE LEVEL OF RELATIONSHIPS

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Abstract:

In recent years, a more holistic approach has been identified in the design and planning of urban spaces and the concept of "Green Infrastructure" has been developed which will help to reveal the designs that are thought to be constructed with plants in more basic concepts. Green infrastructures are a network that is planned and managed strategically in such a way that it is based on areas (parks, green ways, protection zones, etc.) with ecological process support that will contribute to human health and quality of life and sustainability of soil, air and water resources. Urban forests are one of the key components of the green infrastructure in urban scale.

Urban forests are one of the most important green areas of the city with its ecological, aesthetic and architectural, physical and climatic, social and economic benefits which are included in urban ecosystems. Unlike other green infrastructure components such as water, corridor and others, urban forests positively influence the value of green infrastructure formation directly with their biodiversity values. The benefits of the urban forest concept are also among the benefits of the green infrastructure concept. The urban forest and green infrastructure concepts are closely related to the patch-matrix-corridor components at the planning level of the landscape ecology. Urban forest is an important part of the centers in the concept of green infrastructure. As a result, the concept of green infrastructure in both urban and semi-urban environments is an important concept in the upper scale and urban forest is an important component to be evaluated within this green infrastructure. For this reason, the concept of urban forest should be included in the green infrastructure planning process.

Keywords: Ecology, Green Area, Urban, Sustainability

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COMPOSITE EDIBLE FILMS AND THEIR FEATURES

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Abstract:

Edible films are materials that are not synthetic and can be consumed with food, coated with various methods on the surface of the product in order to protect the food, extend the shelf life and provide functional properties. Composition of edible films consists of a combination of one or more substances such as carbohydrate, fat, protein and plasticizer. Nutritional values of foods are supported with edible film coating, especially with the films made of proteins. The antimicrobial and antioxidant substances added to edible films avoid the growth of microorganisms on the food surface and prolong the shelf-life of the foods. It is desired that edible films should be as odorless, tasteless, colorless, transparent, clear as possible, durable and flexible as well as in compliance with the foodstuff in order to avoid the adverse effects during consumption. In addition, edible films are able to meet the different functional needs (moisture barrier, gas barrier, water and lipid solubility, color and appearance, mechanical properties, etc.) of the product to which they are applied. In recent years, the use of edible composite films containing more than one component has become widespread, in contrast to the one-component edible films desired for edible film production. In this study, researches on edible composite films and their properties have been reviewed.

Keywords: Edible Films, Composition, Properties

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GASTRONOMIC TOURISM (CULINARY TOURISM) AND TRADITIONAL FOODS: MARDIN

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Abstract:

Gastronomic tourism can be described as the trips made by tourists to experience local food and beverages. Because as it is thought that approximately one in four of the tourism expenses devote to food and beverage spending, gastronomic tourism is an important source of income for the people of the region. At this point, gastronomic tourism plays an important role in increasing the demand for some tourism attraction centers and in creating new attraction centers. In recent years, geographical indications in our country for traditional food, which is the most important compound of gastronomic tourism, have increased. Geographical indications encourage traditional production and the preservation of the tastes of local food and beverage. Mardin, which is one of the important touristic places of our country with its rich cultural structure and historical places, is among the provinces that has the priority in terms of gastronomic tourism according to the 2014 TUSAD report. Although there are more than 40 regional dishes in Mardin, where many different religions and people live together, only 5 of them have geographical indications. These are Mardin rib fills, Mardin kibe, Mardin sembusek, Mardin ikbebet and Mardin imlebes (almond candy). At this point, the introduction of other regional tastes unique to Mardin will contribute to the expansion of traditional food production and the improvement of gastronomy tourism. In this study, traditional foods and beverages in Mardin province were investigated.

Keywords: Mardin, Gastronomy Tourism, Traditional Foods, Geographical Indications

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APPLICATION OF NEURAL GAS NETWORKS TO OBJECT DETECTION

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Abstract:

One of the topology learning neural network algorithms, neural gas (NG), could be considered as an option to reconstruct the topology of the visual objects. Basically, the unsupervised-based NG algorithm uses fixed number of nodes whereas growing neural gas (GNG) algorithm uses a dynamic size in the neural network. By adding and removing nodes, GNG learns the topology of the input signals/data in an unsupervised manner. GNG networks have no predetermined knowledge about the structure of the input data; the learning phase reconstructs the topology. During the learning phase, many topologically neighbours in the input data set are attempted to be represented and classified by only one leader data of the cluster. However, since the node size is dynamic, based on the criteria of the relation between the neighbour data, new nodes might be added into and the nodes with weak relation would be removed from the network.

In this study, the main differences and application areas of NG and GNG are discussed in detail. The previous studies on the object topology construction and object detection using GNG are reviewed. Both NG and GNG algorithms are implemented using MATLAB. A uniformly distributed random data set is trained using NG algorithm and it is shown that the topology of the input signals are reconstructed and preserved. The experiment results are shown regarding the learning speed and classification performance of the system. Once the training is completed as the pre-process stage, a neural network is used as a classifier to detect the topology of the visual objects. To simulate the visual object detection scenarios, two different types of objects with different topologies are considered. The simulation results are evaluated according to the appropriate detection performance as well as the reduction size and speed.

Keywords: Neural Networks, Neural Gas Algorithm, Topology Learning, Object Detection

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DETERMINATION OF LANKFORD COEFFICIENTS OF COLD ROLLED STEEL FOR DEEP DRAWING

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Abstract:

Deep drawing quality cold rolled steel sheets are widely used in many fields of manufacturing for deep drawing applications, particularly in the automotive industry. Manufacturers employ computer simulations to minimize production cost of dies and to reduce the number of trials prior to real time drawing applications. While a simulation code is performed to predict the formability of sheet metal, some experimental data should be provided to define anisotropic mechanical properties of metal. The Lankford Coefficients (R-value or Strain ratio) are used to characterize plastic anisotropy of metal. Lankford Coefficient of a sheet is calculated by taking the ratio of true plastic strain across the width to that through the thickness of a sample exposed to the tensile test.

In the present study, in order to obtain Lankford Coefficients of drawing quality cold rolled steel in different directions, tensile test specimens were prepared according to relevant standards in the rolling, at 45° to rolling and in the perpendicular to rolling (transverse) directions. R-values and variation of them according to rolling direction were determined. An earing test was also carried out for the verification of results. Additionally, work hardening behavior of the sheet was also investigated by calculating the strength coefficient (K) and strain hardening exponent (n) which are crucial for sheet metal forming. The results obtained from uniaxial tensile test were compared with results obtained from earing test and they found to be compatible. It is noticed that the Lankford coefficients in the rolling and transverse directions are greater than that of 45° to the rolling direction.

Keywords: Cold Rolled Steel, Lankford Coefficient, Formability, Strain Hardening

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EFFECT OF ELECTRIC FIELD ON INTERSUBBAND SECOND ORDER NONLINEAR TRANSITIONS IN SINGLE, DOUBLE AND TRIPLE DELTA-DOPED GAAS STRUCTURES

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Abstract:

In this study, the inter-subband second order nonlinear transitions in single, double and triple delta-doped GaAs structure under applied electric field have been investigate for the uniform doping distribution model. The electronic properties of the structure such as the potential profile, the subband energies, the Fermi energy, the subband concentrations and the wave functions have been calculated by solving the Schrodinger and the Poisson equations self-consistently. The results show that the position and the size of second order harmonic generation (SHG) coefficient depend on QW shapes under applied electric field. Dependence on the electric field strength of the inter-subbands second order nonlinear transitions for different delta-doped GaAs layers is more important for potential variations in photodetectors and optical modulators. In the future these structures will play an important role in the investigation of quantum electronics and photonic devices. The obtained results will be interpreted in comparison with previous studies.

Keywords: Delta-Doping, Self-Consistent, Second Order Harmonic Generation Coefficient, Electric Field.

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MARKER-ASSISTED SELECTION IN DETERMINING OF RESISTANT VARIETIES AGAINST PLANT DISEASES IN THE BREEDING PROCESS

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Abstract:

In recent years, the new fighting methods against plant diseases that cause important crop losses have been developed. These methods are more practical, economic and healthy.

Pesticides are widely used for fighting against the disease, but it is not an environmentally friendly method. Recently, it has been preferred to use resistant varieties in the organic farming. The purpose of resistance breeding is to detect resistance genes, transfer to cultivar plants, and clone. But the development of new varieties in classical breeding requires a long process. The using of molecular markers in the breeding process are more advantage over the other selection techniques and widely preferred today. In this study, it was investigated and compared the disease control methods used against to common bunt disease in Turkey and the World.

We aimed to reveal the advantages and disadvantages of classical and molecular-based selection techniques in the breeding studies. Marker-assisted selection (MAS) includes the molecular-based techniques and is the relatively a new approach method to solve problems of classical breeding techniques. In this study, the importance of using classical breeding and molecular techniques together has been emphasized.

Keywords: Plant Disease, Breeding, Resistance

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DEPENDING ON AL AND IN CONCENTRATION OF THE ELECTRONIC PROPERTIES OF ASYMMETRIC DOUBLE GAALAS/GAAS AND GAINAS/GAAS QUANTUM WELLS

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Abstract:

In this study, the electronic properties of asymmetric double Ga1-xAlxAs/GaAs quantum wells (A structure) and Ga1-xInxAs/GaAs quantum wells (B structure) have been investigated depending on the Al and In concentration, respectively. Using the effective mass approach, the energy levels, the wave functions and the probability densities of these system have been calculated by solving the Schrodinger equation. According to the results obtained, the main differences of A and B structure are the energy gap and the effective mass. For A structure, the barrier is GaAlAs, and the well is GaAs. Whereas for B structure, the barrier is GaAs, and the well is GaInAs. Also, the potential height and the energy levels of A structure are always lower than of B structure. We say that the Al and In concentration have a great effect on the electronic characteristics of asymmetric double quantum well. These properties have a practical interest for the design of tunable semiconductor devices.

Keywords: Asymmetric Double Gaalas/Gaas Quantum Well, Asymmetric Double Gainas/Gaas Quantum Well, Al And In Concentration, Electron

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ENCAPSULATION OF SYNTHESIZED HYDROXYAPATITE IN PCL MICROSPHERES BY USING ELECTROSPRAYING METHOD

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Abstract:

Synthetic hydroxyapatite has been investigated for so many different applications in tissue engineering and orthopaedics. Because of their bioactivity and osteoconductivity properties, it can be used in this special applications1. Polycaprolactone (PCL) are widely being used in tissue engineering operations because PCL is very cheap biodegradable polymers and also it has slow degradation rate and desirable mechanical properties. In order to create a new biodegradable and biocompatible composite scaffolds, self made synthetic hydroxyapatite mixed with PCL by electrospraying method.

Experimental Methods

Calcium nitrate tetrahydrate,Potassium dihydrogenphosphate and distilled water solutions were prepared with sol-gel method. Ammonia was added drop wise to settle pH=11 into the final solution. Prepared solution calcined in different temperatures. 3 wt. % PCL was dissolved in dichloromethane. After that synthetic hydroxyapatite with various percentages as 1, 3 and 5 wt. % were added separately in 3 wt. % PCL solution.

Conclusion

Hydroxyapatite powder was synthesized successfully with the different sintering temperature between 200-1000□C by the sol-gel method. In addition to that, the synthetic hydroxyapatite powder was successfully encapsulated in biodegradable PCL microspheres by using electrospraying method.

Keywords: Hydroxyapatite, Electrospraying Method, Osteoconductivity Properties,

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VERMICOMPOSTING EFFICIENCY OF MARKET SOLID WASTE: THE EFFECTS OF BIO-ONE™ AND MATURE VERMICOMPOST ADDITION

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Abstract:

Vegetable-market solid waste from urban areas is produced in millions tons of waste each year. Such wastes contain a high amount of organic matter so storage in landfill areas means that the waste cannot be evaluated for utility. Since storage volume acquisition from landfill, composting is a good practice of solid waste removal system. Vermicomposting is a composting process realized with organic fraction of solid waste, garden waste and worms. Vermicomposting is a biochemical degradation process of organic materials, which implicates the complex relationships between earthworms and microorganisms. Fruit and vegetable wastes using vermicomposting process were taken from open market areas in city of Denizli. Fruit and vegetable wastes: green yard waste in 50:50 ratio, were used for vermicomposting experiments. The effects of additives on decomposition rate of composting were investigated of composting mixtures. Composting process was carried out in the aerobic reactors made of plastic pots which were monitored for 60 days. Each pots includes 50 adult earthworms, Eisenia Foetida. Temperature, moisture, organic matter, pH, electrical conductivity, total carbon and total nitrogen were monitored during the composting process. In addition, worm number changes of the mixtures were determined.

It was concluded that vermicomposting was faster than decomposition of organic matter compared to traditional composting, and the result C/N ratio was more suitable to use as soil remedial material. The initial C/N ratio of control without worms, control with worms, Bio-One™ addition, mature vermicompost addition; made from market wastes, made from cow dung were 26.9, 26.9, 28.04, 27.83 and 20.43. A decrease of 57%, 40%, 56%, 66% and 48% respectively was observed. It has been shown that Bio-One™ addition and mature vermicompost addition have a positive effect on the acceleration of the process. It can be said that there is a decrease in the amount of organic matter in the same trend.

Keywords: Additives, Bio-One™, E.Foetida, Vermicomposting

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TEMPERATURE DEPENDENCE OF THE IR FREQUENCIES AND FWHM OF THE P (NH2) MODE FOR DMFECU, DMFENI AND DMFEZN CRYSTALS

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Abstract:

The ρ (NH2) IR frequencies and the corresponding FWHM values for DMFeCu, DMFeNi and DMFeZn are analyzed at various temperatures by using the experimental data from the literature. For the analysis of the IR frequencies of the ρ (NH2) mode which is associated with the structural phase transitions in those metal structures, the temperature dependence of the mode frequency is assumed as an order parameter and the IR frequencies are calculated by using the molecular field theory. Also, the temperature dependence of the damping constant calculated from the pseudospin (dynamic disorder of DMA+ cations) –phonon coupling (PS) and the energy fluctuation (EF) models, is fitted to the observed FWHM values of the ρ (NH2) IR mode of DMFeCu, DMFeNi and DMFeZn.

We find that and the observed behavior of the IR frequencies and the FWHM of this mode can be described adequately by the models studied here for those crystalline structures. This method of calculating the frequencies (IR and Raman) and FWHM of modes responsible for the structural phase transitions, can also be applied to some other metal formate frameworks.

Keywords: IR Frequency. FWHM. Phase Transitions. P (NH2) Mode. Dmfecu. Dmfeni. Dmfezn.

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AN INVESTIGATION ON AN ANAEROBIC DIGESTION PROCESS

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Abstract:

Anaerobic digestion can be defined as a biological decomposition of organic materials by means of several types of microorganisms in the absence of oxygen to produce biogas. The main products from an anaerobic digestion are methane and carbon dioxide. The other byproducts are water vapor, ammonia and hydrogen sulfide. An anaerobic digestion is comprised of four main stages such as hydrolysis, acidogenesis, acetogenesis and methanogenesis. There are many advantages of an anaerobic digestion that causes a considerable reduction in the organic load due to the biological reactions. Therefore, it is a complete depollution. An anaerobic digestion also has some other advantages such as economic, agronomic and environmental advantages. In the past years, high capital and maintenance costs were needed for typical anaerobic digestion systems. However, in the last decade, these costs are reduced by means of the technological developments in this area. And nowadays, an anaerobic digestion process becomes an important issue in the consideration of both energy recovery and waste disposal aspects. Moreover, new policies and regulations are forcing to direct this area all over the world. There are many numerical and experimental studies carried on this field, including the investigation of the effects of the variables on the process. In this study, a lab-scale experimental set-up which is established for a case study on an anaerobic digestion will be introduced. An anaerobic digester (AD) is constructed for the concept of waste-to-energy design with loading capacity of 18 lt. For biogas production, various types of waste will be filled into the AD, and then the produced gases will be compared with regards to the contents of the wastes. The prerequisites, the experimental ranges and the variables that influence the anaerobic digestion process will be established.

Keywords: Anaerobic Digestion, Energy Recovery, Hydrolysis, Acidogenesis, Methanogenesis

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A CASE STUDY ON AN ACTUAL POWER PLANT IN TERMS OF THERMODYNAMIC ASPECT

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Abstract:

In this study, thermodynamic analyses are performed for an existing power plant in Iskenderun, Turkey, with an installed power capacity of 1200 MWe. The annual power production of the plant is about 8837 GWh on the condition of 7364 h annual operation time. The plant was founded by means of 2x600 MWe units. For each 600 MW nominal output power, 1900 ton/h of steam flow rate is produced by means of 216 ton/h of fuel consumption with a boiler efficiency of 93.15 % and an average lower calorific value of coal with 6000 kcal/kg. Atlas Iskenderun Thermal Power Plant has a particle concentration of the gas on the chimney outlet as 10 mg/Nm³. It is the cleanest power plant in Turkey in terms of flue gas powder emission due to the usage of the bag filter system instead of classical electrostatic filters. Herein, thermodynamic analyses are carried out by utilizing the actual operating data and the results will be compared with the nominal ones given above. The improvements that are necessary in order to increase the overall efficiency of the power plant will be pointed out in the aspects of energy recovery.

Keywords: Power Plant, Thermodynamic Analysis, Energy Production, Energy Recovery

[*]*This study is supported by Gaziantep University Research Project Administration Unit BAP under the grant no of RM.16.01.*

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INVESTIGATION OF EXTRUDABILITY OF P/M BILLETS BY FEM

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Abstract:

The materials obtained by powder metallurgy have been using many fields especially in automotive and aerospace. On the other hand, increasing competitive conditions forces the manufacturer to produce more economic and durable P/M products. Aluminum is one of the most used engineering materials because of its light weight, strength, flexibility etc. It is the most used material for the extrusion process. In extrusion, a billet is put into container and forced to die core giving product shape by a stem. In this study, aluminum powder billets were prepared. The billets were compressed under the load before extrusion. The billets were sintered for 2 hours at 550 ˚C. Standardized compression tests were applied to define mechanical properties of material model for DEFORM 3D simulations. Extrusion of sintered powder material was simulated by FEM based software named DEFORM 3D. True stress – true strain curves were compared each other. It was aimed to obtain high strength materials from sintered powder billets by extrusion process.

Keywords: Aluminum, Extrusion, Powder, DEFORM, Fem

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SIMULATION AND PREDICTION OF MAXIMUM EXTRUSION TEMPERATURE DURING THE STROKE

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Abstract:

The extrusion process is used to produce the desired profile forms. In this process, the initial workpiece is placed into the container and forced to the die opening giving the profile form. Many factors such as extrusion speed, temperature, extrusion ratio, die design and friction effect the extrusion. Among them, temperature is one of the most important parameter for extrusion process. In practice, there is a very complicated thermal change during the extrusion process. The container is heated before the hot billet put into it to provide a temperature balance between billet and container. Due to the deformation and friction of the workpiece in the die bearing, mostly an increasing temperature occurs during the stroke. The temperature changes during this time particularly depends to the heat transfer from the billet to the container, deformation and friction. The maximum temperature is usually seen in the die corners and die bearing where the intense deformation occurs in the workpiece. As the increased temperature generate the risk, it is important to determine the upper limit of the temperature. In practice, the temperature value can be observe on the profile only in the exit of the die. However, the temperature in the different points not only in the die exit but also in the die corners and die bearing can be analyze by finite element method (FEM). In this study, the maximum extrusion temperature during the stroke was analyzed by (FEM) for different conditions. Then, the obtained data from FEM was used to predict the results by artificial neural networks (ANNs). Hereby, it is aimed to arrange the initial process parameters to work under the maximum temperature meaning safe work conditions for extrusion.

Keywords: FEM, ANN, Extrusion, Temperature

[*]*This study was supported by Dicle University under the project MUHENDISLIK 17.017*

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CHEMICAL FIXATION OF AUTOMATIVE INDUSTRY COATING SLUDGE CONTAINING NICKEL AND ZINC USING SILICA FUME AS ALTERNATIVE BINDER TO PORTLAND CEMENT

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Abstract:

The purpose of this study was to investigate the disposal of automotive industry phosphate coating sludge by stabilization/solidification technology. Silica fume (SF) was used as an alternative binder to Portland cement (PC). Silica fume being one of the most popular pozzolans is considered to play a vital role in developing strength, durability characteristics and consuming calcium hydroxides during the hydration reaction of Portland cement. Mortar and paste samples were prepeared for laboratory tests. %5, %10 and %15 weight ratio of phosphate sludge (PS) mixed with PC and the 10% of SF for prepearing of mortar samples. At the first step of the study, chemical composition of PS and binder agents were determined. Water to solid ratio was chosen as 0,5 for all mortar samples. Initial and final setting times were determined using Vicat needle. Unconfined compressive strength (UCS) values of mortars were measured following 7, 28, 56 and 90 days of water curing. Toxicity Characteristic Leaching Procedure (TCLP) was conducted for hardened mortar and paste samples after 28 curing days. Zn and Ni concetrations were measured using Inductively Coupled Plasma (ICP) Spectroscopy. PS and SF retarded the initial and final setting times of PC. UCS values of mortar samples containing %5 PS determined after 90 days of curing were smilar with the reference sample results. UCS values of mortar samples containing 10% and 15% PS were lower than the reference sample. TCLP results of the mortar samples showed that heavy metals were not conformed with the EPA lanfilling limits. However, Zn concentrations of the paste samples were conformed with the EPA landfilling limits.

Keywords: Phosphate Sludge, Silica Fume, Portland Cement, Compressive Strength, Tclp

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PRODUCTION AND CHARACTERIZATION OF PMMA/TIO2 COMPOSITE THIN FILMS FOR DIELECTRIC APPLICATIONS

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Abstract:

In this study, PMMA/TiO2 composite film was manufactured on Si wafer and fused silica glass substrates. Chloroform (CHCl3) was used as solvent to dissolve Poly (metyl methacrylate) (PMMA) [CH2C(CH3)(CO2CH3)]n granules. The solution was heated up to 40 oC and stirred until the polymer was completely dissolved and a clear viscous solution was obtained. Titanium dioxide (TiO2) particles were synthesized by flame spray pyrolysis method and heat treatment was carried out to obtain crystalline TiO2 particles. The particles were suspended into solution with different content by weight of PMMA. In order to decrease surface tension, Triton X-100 was added to polymeric solution as a surfactant. Final mixture was then sonicated for 1 hour at room temperature to disperse TiO2 particles homogeneously and avoid agglomeration in viscos polymer solution. The mixture of PMMA/TiO2 was coated on substrates by cost effective spin coating method, which provides thin and homogen films. The films were heated up to 50oC for 1 hour in air to evaporate solvent and to get a smooth surface. Structural, optical and dielectrical properties of PMMA/TiO2 composite films were characterized by XRD, SEM, UV-Vis spectrophotometer and dielectric analyzer. Dielectric and optical measurement revealed that presence TiO2 nanoparticle highly influences the dielectric and optical properties of the films. Particularly permittivity of the composite films was increased with increasing TiO2 content.

Keywords: Tio2, PMMA Composite, Dielectric And Optic Properties.

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COMPARISON OF STRUCTURAL AND OPTICAL PROPERTIES OF FLAME SPRAY PYROLYSIS AND SOL-GEL DERIVED SRAL2O4:EU+2/DY+3 PHOSPHORUS

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Abstract:

In this study Sr0.985Al2O4 :0.005Eu2+/0.01Dy3+ luminescent materials with long afterglow and high intensity were synthesized by flame spray pyrolysis and sol-gel technique. Initially precursor solutions of Sr(NO3)2, $Al(NO_3)_3.9\ H_2O$, Eu(NO3)3 · 5H2O, Dy(NO3)3·xH2O were prepared using appropriate solvent. Alcohol based solvents were mainly preferred to avoid extinguishing of flame. All of the precursor solutions were mixed and H3BO3 was added to mixture to reduce heat treatment temperature. The final mixture was divided into two separate beaker to use flame spray pyrolysis and sol-gel processes. Before the heat treatment, thermal properties of the powders were investigated using DTA-TG device. Organic structure of two different powders were characterized by FTIR instrument. Phase structure of the phosphors were compared using XRD device. Morphological differences between two powders were investigated by SEM micrograph. Emission spectra of Sr0.985Al2O4 :0.005Eu2+/0.01Dy3+ phosphorous were compared. The results revealed that there are essential structural differences and related to this optical diversities were observed.

Keywords: Sral2o4:Eu+2/Dy+3 Phosphorus, Flame Spray Pyrolysis, Sol-Gel, Luminescent

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DETERMINATION OF FORAGE YIELD AND YIELD COMPONENTS OF SOME FORAGE PEA VARIETIES (PISUM SATIVUM L.) IN BILECIK ECOLOGICAL CONDITION

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Abstract:

This research was carried out to determine the yields and yields of some pea varieties and lines developed for feeduse in Bilecik Seyh Edebali University Agricultural Biotechnology Practice and Research in the field of Random Blocks Experiment Design in four (4) It was conducted. In this research, 6 pieces of forage peas (Tore, Servet, Whistler, Ulubatli, Golyazi, Kirazli) and 14 feed peas lines (KB-211, 21, 39, 55, 70, 79, 90, 95, 104, 110, 124 , 141, 153, 161).

According to the one years average results, the differences between the number of pods found in a plant, main stem thickness, and forage yield were not statistically significant. Differences between forage pea genotypes in terms of dry matter yield, main stem length and natural plant height are statistically significant. However, it has been determined that 70 numbered line are the genotype of the best variety in terms of yield of forage with 2200 kg / da. In terms of dry matter yield, it was determined that KB-211 genotype was the best with 734 kg / da values.

Keywords: Forage Pea, Forage Yield, Adaptation

[*]This study is supported by Scientific Activities Support Program of Bilecik Seyh Edebali University

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DETERMINATION OF SEED YIELD AND YIELD COMPONENTS OF SOME GRASS PEA VARIETIES (LATHYRUS SATIVUS L.) IN BILECIK ECOLOGICAL CONDITION

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Abstract:

This study was carried out in order to determine the quality of the grass pea varieties which are suitable for the region in order to remove the high quality feed loaf found in the region. The research was carried out the planting in winter in 2016-17 with four (4) replications in the field of Agricultural Biotechnology Application and Research in Bilecik Seyh Edebali University according to the Randomized Blocks Experimental Design. In this research, 6 variety of Grass pea (Gurbuz, Gap Mavisi, Gurbuz 2001, Karadag, Iptas, Eren) were used.

According to the one years average results, the differences between the varieties in terms of physiological seed maturity number of days, number of pods per plant, number of seeds per pod, seed yield, biological yield, straw yield and harvest index were found statistically significant. The number of days of physiologic seed maturity observation was 205.00-213.67 days, the number of pods per plant was 21.20-32.27 pods plant-1 and the number of seeds per pod was 2.60-3.40 seeds pods-1, the seed yield was 128.70-458.00 kg da-1, the biological yield was 622.30- 1343.00 kg da-1, straw yield 438.7-1033.0 kg da-1 and harvest index varied between 14.0% and 34.3%. However, the highest yield of seeds was obtained from Iptas grass pea variety with 458.00 kg da-1value, and the highest biological and straw yield were obtained from Eren grass pea variety with 1343.00 kg da-1 and 1033.00 kg da-1 value, respectively.

Keywords: Grass Pea, Seed Yield, Yield Components, Adaptation

[*]*This study is supported by Scientific Activities Support Program of Bilecik Seyh Edebali University*

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EPIPHYSEAL PLATE DIFFERANTIATION IN SYNOVIAL TYPE JOINTS OF NEONATAL RATS

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Abstract:

Synovial joint is distinguished by a surrounding synovial capsule from the other joint types. Most of the skeleton develops through endochondral ossification, in which an initial cartilage model is replaced by mineralized bone tissue with the exception of the joints that are capped by articular cartilage. Given the crucial role of epiphyseal growth plates in bone growth, the growth plate processes of chondrocyte proliferation, hypertrophy, calcification, and ossification zones result in distinct zones of cartilage representing different stages of the chondrogenic program.

Wistar albino of 7, 15 and 30 day old neonatal rats were used in this study. Rats were kept at room temperature and 12 hours light, 12 hours dark periods and were fed with normal diet. 7, 15 and 30 days old rats were divided into three different groups. At the end of 7, 15 and 30 days, euthanasia was carried out by injection of 200 mg/kg penthatol sodium intraperitonally. Long bone tissues were obtained and processed for light microscopy and morphometric measurements. Paraffin tissue sections were used for either different stainings to show general morphology or morphometric analysis to determine differences between cells in growth plate. Field of views were photographed using an Olympus microscope. Growth plate was measured from five different points and subsequently the statistical analysis using the statistical Spss program was carried out individually by measuring each of the stages of the growth plate using a program called Zen on Zeiss Axiocam microscope.

According to this study we determined that there is a significant differences in all phases of the growth plate. These results suggest that endocrine regulators such as estrogen-receptor expressed on chondrocytes in the growth plate, insulin-like growth factor (IGF-1) and other sex hormones, which are important effects in bone resorption and bone formation, may have a significant role in bone growth.

Keywords: Growth Plate, Endochondral Ossification, Long Bone, Synovial Joint, Rat

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FABRICATION OF A NEW PVC MEMBRANE PH ELECTRODE AND ITS APPLICATIONS IN REAL SAMPLES

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Abstract:

Accurate and reliable measurement of the pH in chemical, biological, clinical, industrial and environmental samples is always important.pH maesurements are most often made by using a glass electrode. It is the most popular electrode owing to its high selectivity, reliability and dynamic pH range. However, there are some limitations such as its high resistance, fragility and instability in acidic solutions of fluorides.

Due to their low electrical resistance, ease of preparation, cheap cost, studies on the development of alternative pH electrodes based on ionophore doped- PVC membranes have gained momentum. Various ionophores for PVC membrane pH-electrodes have been reported in the literature. Among these, calix[4]arenes are widely applied compounds in ion recognition Hence, we focused on the possibility of using previously synthesized 5,11,17,23-Tetra-tert-butyl-25,27-bis[(4-nitrophenyl-1-yl)-thiosemicarbazide-carbonyl-methoxy]-26,28-dihydroxy-calix[4]arene in the construction of a new PVC Membrane pH electrode. For this purpose, membranes with various combinations were prepared by changing the ratio of ionophore, PVC, plasticizer and lipophilic anion in order to determine the optimum membrane composition. The response time, the lifetime of the electrode, its selectivity against some ions by using fixed interference method, optimum working range and other performance characteristics were investigated.

The proposed electrode exhibited linear response over the pH range 1.9–12.4 with a sub- Nernstian slope at 20°C. It was successfully employed for the determination of pH and acidity in real samples and in HF medium.

Keywords: PVC Membrane Ph Electrodes, Titratable Acidity, Potentiometry

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RELATIONSHIP BETWEEN FAILURE OF IMPLANTATION AND PROLIDASE ENZYME

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Abstract:

Failure of implantation, good embryos are unable to achieve successful implantation and pregnancy as a result of normal uterine transfer. The causes of this disease are maternal age, poor endometrial receptivity, sub-optimal embryo transfer technique, genetic factors and coagulation disorders, respectively. This disease has also been shown to be closely associated with poor endometrial receptivity, uterine cavity factor, endometrial thickness, immunological factors, KOH protocol and endometriosis. Prolidase enzyme is an enzyme that hydrolyzes the peptide bond of imidodipeptides (X-Pro, X-Hydroxyproline), including proline or hydroxyproline at the carboxyl terminal position. Prolidase enzyme also plays an important role in the catabolism of prokaryotic, collagen and proline or hydroxyproline inducing enzymes in the cell. In the absence of the prolidase enzyme, some rare inherited autosomal recessive inherited diseases have been identified. Prolidase is a enzyme metalloproteinases manganese dependent. Metalloproteinases are an important enzyme in trophoblast invasion. Thus, prolidase enzyme may have a significant effect on the implantation and invasion of trophoblasts.

In this study, the relationship of prolidase enzyme on success of implantation was aimed.

Keywords: Prolidase, Rif, Metalloproteinases

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THE EFFECT OF OXIDATIVE STRESS ON THE ECTOPIC PREGNANCY

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Abstract:

Ectopic pregnancy is known to occur when the embryo, which is the result of the association of sperm and egg cells, is placed at a different location outside of the uterus. The embryo is located in the uterus. In addition, ectopic pregnancy does not result in delivery. If diagnosed early, the chances of treatment are high. Oxidative stress is known to be the damaged in favor of free radicals of the balance between free radicals and antioxidants. Oxidative stress can cause many diseases. Free radicals can occur due to UV rays, drugs, oil oxidation, immune system reactions, radiation, stress, smoking, alcohol. The resulting free radicals lead to cardiovascular disease, cancer, diseases related to decreased blood circulation of the brain, diseases of the nervous system tissues, diabetes, sudden renal failure, emphysema, bronchitis, lung diseases, alcoholic liver diseases, aging related tissue disorders and distupt the function of utern tubes so that can cause ectopic pregnancy.

In this study, the effect of oxidative stress on the ectopic pregnancy was aimed.

Keyworld:ROS, Ectopic pregnancy,PID

Keywords: ROS, Ectopic Pregnancy,Pid

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PRELIMINARY RESULTS OF SPECTRAL DECAY PARAMETER ESTIMATION FROM RECENTLY-COMPILED STRONG GROUND MOTION DATABASE OF TURKEY (TR-NSMN)

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Abstract:

Attenuation models which state the decrease in amplitude of the seismic waves with distance do not describe exponential spectral decay of S-waves observed at high frequencies. Above the threshold frequency, this phenomenon, seen as deviations from the ω2 source model, is modeled as the near-surface attenuation parameter (Kappa, κ). κ factor estimates the spectral decay of the higher frequencies and it is one of the essential parameters for stochastic strong ground motion simulation method. Although the origin of κ is still under debate, it is considered the combination of both site and path effects. To eliminate the path effects, zero-distance kappa value (κ0) is usually computed. In this study, we used the recently-complied strong ground motion database of Turkey which consists of records from mostly small and moderate-size earthquakes with a smaller number of records from large events. Kappa factors are manually computed from the S-wave portion of both horizontal and vertical components for each record. Then, we investigated magnitude and epicenter distance dependence of the κ values. Kappa estimations reveal that there is a significant scattering at the majority of the investigated sites. Currently, a linear effect of distance and magnitude on kappa could be statistically significant for our database. The scattering of these initial kappa estimates could be attributed to the influence of the source and wave propagation path associated with the complex tectonic structure of the region.

Keywords: Near-Surface Attenuation, Kappa (K) Factor, Ground Motion Simulations, Turkey

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ASSESSMENT OF THE PRESSURE AND IMPACTS FOR SURFACE WATER BODIES ACCORDING TO EUROPEAN WATER FRAMEWORK DIRECTIVE: BUYUK MENDERES BASIN, TURKEY

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Abstract:

Aim of the study: It was aimed to reveal the pressures and impacts assessment of Buyuk Menderes Basin which is one of the Turkey's Basins according to European Water Framework Directive (EU WFD) in this study. Results: Within the BMB borders there are 10 provinces and their percentile distribution in the basin is; Afyonkarahisar (12.61%), Aydin (29.28%), Burdur (0.17%), Denizli (32.09%), Isparta (0.58%), Izmir (%1.79%), Kutahya (0.03%), Manisa (0.01%), Mugla (9.50%) ve Usak (13.94%). Afyonkarahisar, Aydin, Denizli, Mugla and Usak provinces are exposed to point source pressures in the basin. Point source pressures can be grouped into urban wastewater, industrial wastewater, leachate and geothermal waters. Industrial sectors causing pollution in the basin are textile, leather, technical and mining. The surveys were applied to different sectors in the study. The main objective of the survey study is to determine the discharge standards, to provide data for use in modelling and pressure and impact studies. The surveys were applied to individual industrial firms and Organized Industrial Zones (OIZ) and Urban Wastewater Treatment Plants (UWTP), which are point sources. The pressure and impact assessment were based on the data from the survey. In addition to the survey studies, on-site studies were carried out in the field. According to the industrial distribution of individual industrial firms operating in BMB, the sectors with the highest share are food, textile, metal, metal, paper, leather, drink and chemistry. Among these sectors, food sector is in the first place with 19 sectors, this sector is followed by 16 sectors with textile and 5 sectors with metal. There are 14 organized industrial zones (OIZ) within the BMB. There are 4 sanitary landfill facilities in BMB and only 1 of them have leachate treatment facilities. There are 28 geothermal energy producing companies in BHM, 23 of them are in Aydin province and 5 of them are in Denizli province. Another source of pollution in BMB is olive and olive oil production and there are 151 olive oil production facilities in Aydin province. In BMB, the wastewater from agricultural, livestock, irregular solid waste landfills, and mining activities have been identified as non-point pressure sources. There are only 4 sanitary landfill facilities (Aydin, Didim, Denizli, Usak provinces) in the BMB and all remaining settlements have irregular solid waste disposal sites. Marble quarries and sectors are operating in Mugla and Aydin provinces, mainly Usak province, within the BMB.

Keywords: Buyuk Menderes Basin (BMB), European Water Framework Directive (EU WFD), Impact, Pressure, Surface Water, Turkey.

[*]*We thank to the 112G021 KAMAG TUBITAK Council Project for providing of the work described in this study.*

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PROTEOMIC ANALYSIS ON CYSTEINE-INDUCED CHROMIUM TOLERANCE IN MAIZE (ZEA MAYS L.) SEEDLINGS

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Abstract:

Heavy metal stress has become a foremost environmental threat to crop production. Chromium (Cr), considered as non-essential trace element, has negative impacts at higher concentrations. Inorganic sulfur fixed into cysteine (Cys), and Cys is afterwards incorporated into glutathione and proteins which play an essential role in plant defense responses. Although recent reports suggest the alleviating roles of Cys in plants against various abiotic stresses, there are few studies on Cr stress. Therefore, the influence of Cys on the Cr tolerance mechanism in seedlings of maize (Zea mays L. cv. Bora) was investigated using physiological measurements combined with proteomics. Hydroponically grown seedlings were treated with 100 µM Cr with or without 0.5 mM Cys. Results showed that exogenously applied Cys improved the plant growth under Cr stress. In total, 60 proteins differentially regulated by both Cys and Cr were revealed by 2D PAGE, and 50 proteins were successfully identified by MALDI-TOF/TOF MS. The identified proteins were involved in various cellular responses and metabolic processes including stress defense, energy metabolism, and others of unknown function. Protein spots involved in the defense response such as pathogenesis-related proteins, glutathione peroxidase, superoxide dismutase, glutathione S-transferases and glyoxylases were significantly up-regulated by Cys under Cr stress, suggesting that these proteins could play a role in the Cys-induced Cr tolerance in maize seedlings.

Keywords: Zea Mays, Chromium, Cysteine, Proteomics, Tolerance

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THE EFFECTS OF ROSMARINIC ACID ON CISPLATIN TOXICITY IN HEPG2 CELLS

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Abstract:

In the present study, the effects of anticancer effects of rosmarinic acid (RA) on liver carcinoma (HepG2) cell line and the effects of injury RA on cancer cells resulting from cisplatin (CP) toxicity were investigated. For this purpose, cytotoxicity of RA and CP in HepG2 cells were determined by MTT ; (3-4,5-dimetil-tiyazolil-2,5-difeniltetrazolyum bromid) analysis. Comet and micronucleus methods were used to determine the effect of RA on the genotoxicity of HepG2 cells. Four groups of cells were formed (1st group: control group, 2nd group: administered with RA at LD0 dose, 3rd group: CP applied group, 4th group: RA was applied at the dose of LD0 after CP administration) in the study.The chemotherapeutic agent LD50 doses of CP (11,06 µg/mL) was used as the DNA-damaging agent. The cultures were treated with LD0 doses of RA (1.25 mM) alone or in combination with CP. The results showed that RA exerted no genotoxic effect, but significantly reduced the frequency of micronuclei and the extent of DNA damage induced by CP at the RA LD0 dose tested. The antioxidant activity of RA might be involved in the reduction of CP -induced DNA damage observed in the present study.

Keywords: Cancer, Cisplatin, Rosmarinic Acid, Cytotoxicity, Genotoxicity

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COMPARISON OF METHOTREXATE CYTOTOXICITY IN A549 AND MCF-7 CANCER CELL LINES

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Abstract:

Surgical approach, radiotherapy and chemotherapy have been used in cancer treatment for many years. Several drugs are used as chemotherapeutic agents for the treatment of various types of human cancers. Methotrexate (MTX) is now used widely for the treatment of acute leukemia, non-Hodgkin's lymphoma, osteogenic sarcoma, choriocarcinoma, breast carcinoma, pulmonary and epidermoid carcinoma, and intrathecal chemotherapy. MTX is 4-amino-4-deoxy-N10-methylpteroylglutamic acid. It is seen in literature that this agent is used in different experimental studies in vivo-in vitro conditions on various cell lines. However, few studies have been conducted to compare toxicity levels in different cell lines. In the present study, it was aimed to determine the cytotoxicity of MTX in different cancer cell lines (A549 and MCF-7) and to compare them with each other under the same working conditions. For this purpose, cytotoxicity of MTX in A549 and MCF-7 cells were determined by MTT ; (3-4,5-dimetil-tiyazolil-2,5-difeniltetrazolyum bromid) analysis. Depending upon the MTT results, cytotoxic doses were found as > 1 mg/ml for A549 and MCF-7.

Keywords: Cancer, Methotrexate, Cytotoxicity

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ANALYSIS OF NATIONAL AND INTERNATIONAL NEWS WEB SITE MAIN PAGE IMAGES WITH MICROSOFT COGNITIVE SERVICES

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Abstract:

Today, computer vision techniques are often used in detecting and analyzing images. Cognitive services, which are more recently provided by Microsoft, are some of outstanding technological developments in these areas. Microsoft Cognitive Services provides various services such as image, face, emotion, speech recognition, detection and classification.

In this study, results obtained from pictures on home pages of many national and international news web sites via a developed software using Microsoft Cognitive Services are presented as graphs. It can be seen that national news websites have more images than international news websites. While there are men in the majority of these images, it is observed that national news websites prefer women images more than international news websites. It can be said that national and international news web sites follow a generally parallel emotional content structure in their home page images. However, it is seen that 29.22% of the pictures are happy and 60.31% of the pictures are benefiting from the neutrality items as the outstanding parameters.

Keywords: Microsoft Cognitive Services, Face, Emotion, Text, Detection, Recognition

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STATISTICAL ANALYSIS OF THE NUMBER OF FOREIGN STUDENTS IN TURKEY

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Abstract:

Nowadays, with the developing opportunities, the distances between the countries have lost importance, and every year countless people travel to places outside the country where they live. One of the most important of these travel aims is the education. Data mining is the process of finding anomalies, patterns and correlations within large data sets to predict outcomes and it has become one of the most important subjects to create a convenient study environment. In this study, a database was formed by taking the official data of the students who come to our country to continue their education life abroad and registered in our universities, from the Council of Higher Education Institution. With the help of the database, the distributions of these students in our country were analyzed by parameters such as number of students, gender, fatherland, registration year and the university they registered. According to analysis, the number of foreign students who came to our country to receive undergraduate education between 2013-2016 is 316340 which is consist of 32.01% female and 67.99% male. While the number of foreign students in our universities constitutes 5.48% of the total number of students in all our universities in 2013, this rate increases every year to 7.82% in 2014, 8.94% in 2015 and 11.23% in 2016. When the most preferred cities by students are listed, Istanbul is in the first place with 89563 students, followed by Ankara with 41516 students and Eskisehir with 15868 students. 1.71% of the Istanbul University, 0.05% of the Anadolu University and 1.87% of the Marmara University are foreign students which happen to be top three most preferred universities by students. As the result of the analysis, interrelationships between parameters are expressed in graphs.

Keywords: Foreign Students, Statistical Analysis, Database, Turkey, Data Mining

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THE INFLUENCE OF GENDER ON THE PERCEPTION OF BLAST INDUCED VIBRATION

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Abstract:

Nowadays, blasting operations are commonly used in rock excavation. While in a large part of the explosive energy is used to break or fragment rocks, a part of the this energy spread in the rock mass and is caused vibrations at excavation works with blasting. Several mines and excavation works with blasting are close to cities and towns. Therefore, daily blasting activities are felt by people living at proximity of them. In such case, several problems and complaints are inevitable. People living in these areas can be uncomfortable by the blast induced vibrations, even if the structures in these areas are within the permissible vibration levels according to regulations. In blasting operations, not only building damage limit values but also human perceptions should be considered. For this aim, drilling and blasting operations in a limestone quarry located in Izmir/ Turkey were followed and blast induced vibrations were measured from this quarry. Firstly, volunteer participants were taken to the open pit. Then, these volunteers were surveyed about the vibrations exposure and perception, while blast induced vibrations are being recorded for the blast. 76 surveys were obtained from the blast events. The questions were prepared according to 4 point likert scale in order to classify the vibration and to determine the level of perception. Within the scope of this study, first of all, reliability analysis of the survey was carried out to determine whether the items in this survey was related to each other and the scale was reliable. After it was concluded that the survey was reliable, influence of the gender on human response to vibration was investigated. For this purpose, Participants' answers were evaluated by independent t-test using SPSS software and it was analyzed whether there was a meaningful relationship between gender and vibration perception.

Keywords: Blast Induced Vibration, Human Perception

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CARBON BALANCE AND WOODY DEBRIS IN COPPICE OAK FORESTS

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Abstract:

Coppice originated forests and oaks (Quercus) have an important value in Turkish forests and forestry. With rotational clear-cuts in these former coppice oak forests, the management gives significant ecological effects to ecosystem as well as to the carbon sequestration. Forest ecosystems have prominent importance in carbon balance. Woody debris is substantial component for carbon stocks to keep carbon in forest ecosystems. Due to the availability of woody debris as coarse and/or fine, this component needs more attention for a detailed research. Woody debris decay rates are very important on carbon balance depending on many conditions such as climate and site characteristics.

This study was conducted in pure coppice originated oak forests in Demirkoy-Kirklareli. where the coppice forest management was applied extensively. In research area, biomass and carbon mass in different ecosystem compartments were formerly assessed. Woody debris were collected from stands in different development stages (diameter at breast height (D1.3m) in which small-diameter forests (SDF) = 0–8 cm, medium diameter forests (MDF) = 8–20 cm and large-diameter forests (LDF) = 20–36 cm). 18 sample plots in each development stages (54 in total) were sampled according to the guidelines.

All woody debris samples were thinner than 10 cm in diameter, thus, all collected woody debris materials was in “fine woody debris (FWD)” class. After the calculations by adding the carbon mass of fine woody debris to total ecosystem carbon pool without root carbon mass (mineral soil (1m-pedon), forest floor, ground cover and above ground tree biomass) and comparison with the former study in same but a larger region, the rates of carbon mass of FWD to total ecosystem carbon mass were determined as 0.39% in SDF, 1.03% in MDF% and 1.23% in LDF.

Keywords: Clear Cut, Dead Wood, Development Stage, Organic Matter, Sequestration

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THE EFFECT OF TOSYA SARIKILCIK RICE SHELL CONCRETE ADDITIVE TO THE TENSILE STRENGTH OF CONCRETE

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Abstract:

The harmful effects of construction materials to environment and living beings are continuously observed today, although the construction sector is living its brightest period. In order to reduce the harmful effects to a minimum level, alternative searches instead of harmful materials are still continuing. Therefore, at recent times, the ecological materials are mostly preferred in many sectors especially in the construction sector. Around the world, the amount of concrete per capita became greater than 1 m3/year, and unfortunately the use of concrete increases with every passing day. Therefore, the harmful effects of cement factories to the environment increase, and nearly 5% CO2 release occur. Due to the environmental damages and high cost of cement, the use of nature friendly alternative material became important instead of cement. Today, the nutrient of half of the 1.6 billion world population is rice. As a result of that much rice production, there is obtained rice shell as the waste material. In this study, the rice shell ash instead of cement was used to evaluate the waste material and decrease the use of cement, and its effect on the tensile strength of concrete was investigated. The rice shell ash was used instead of cement with 0%, 10%, 20% and 30% ratios, and 1% ratio of hardening accelerator was added to the specimens of same ratios in the other control group to increase the early fresh strength. The tests were performed at the 7th, 28th and 90th days. As a conclusion, it was observed that the rice shell ash used instead of cement decreased the weight of concrete and affected the concrete strength favorably.

Keywords: Ecology, Rice Shell Ash, Concrete Strength

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THE DETERMINATION OF THE CRACKS ON THE CONCRETE SPECIMENS USING DIGITAL IMAGE PROCESSING

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Abstract:

The objective of this study is to investigate the effect of different additives on the concrete specimens prepared under standard conditions by making fracture analyses using the image processing methods coded with MATLAB program. Matlap program is widely used in image processing. In this study, the development of cracks in the concrete using matlap program was investigated. For this purpose, five specimens were prepared in 50x50x12 cm dimensions to represent the slabs. Additionally six representative slab specimens of 15x15x15 cm dimensions were also prepared for each type of concretes formed with micro synthetic additive, macro synthetic additive, steel fiber additive, reinforced concrete and reference concrete. After totally 30 cubic specimens were subjected to this investigation, a series of images of these specimens were taken regularly at the 7th, 14th, 21st and 28th curing days. Then these images were processed with the software program coded in MATLAB to obtain the required data.

Keywords: Digital Image Processing, Fiber Concrete, Concrete Additives, MATLAB.

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COMPARISON OF SILANE COUPLING AGENTS AS SURFACE MODIFIERS FOR IMPROVEMENT OF MECHANICAL AND PHYSICAL PROPERTIES OF POLYURETHANE ELASTOMER/DIATOMITE COMPOSITES

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Abstract:

Polyurethanes can be obtained in different forms such as foams, adhesives, coatings, elastomer and fibers by changing polyol structure. Polyurethane elastomer (TPU) is one of the most commonly used types of these forms with the advantages of recyclability and practical processability using traditional methods in industry. Diatomite is a sedimentary rock which is a form of amorphous silica consisting of porous structure with numerious channels encapsulated in a shell [1]. Inorganic character of the diatomite makes it incompatible with polymeric matrices. The most commonly used method to overcome this challange is applying surface modification to filler surfaces. Covering filler surface with silane coupling agents seems to be the most feasible solution in this case [2].

This research is focused on the improvement of interfacial adhesion between the diatomite filler and TPU matrix by performing surface modifications with four different silane coupling agents. Since a natural mineral was used as filler, bio based TPU was preferred as matrix. TPU/diatomite composites were produced by melt mixing method and test samples were prepared by injection molding. Analysis of the samples show that thermal, mechanical and morphological properties of composites were enhanced by applying surface modification.

Keywords: Thermoplastic Polyurethane, Diatomite,Mechanical Properties, Silanization

Acknowledgement
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HOMOGENEITY AND TREND ANALYSIS OF METEOROLOGICAL DATA OF THE ADANA METEOROLOGY STATION IN TURKEY

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Abstract:

Climate change and global warming are one of the most important environmental problems in recent years. There are many studies on this subject in the world. In this study, trend analysis and change points at annual timescale of the meteorological data (maximum precipitation, total precipitation, maximum temperature, minimum temperature, mean temperature, relative humidity, total evaporation and wind speed) of Adana meteorological station (Station No:17351) during the period 1963-2016 in Seyhan Basin were studied. The Standard Normal Homogeneity Test (SNHT) and Pettit tests were used in determining the change points of meteorological parameters while Mann Kendall, Spearman's Rho and Innovative Sen trend methods were used for trend analysis. These tests were examined according to the significance level) 95%. For the Adana Station, according to the 95% significance level, minimum, maximum and mean temperature data show an increasing trend while the wind speed data shows a decreasing trend. No statistically significant trend was determined for other meteorological parameters during the period 1963-2016.

Keywords: Trend Analysis, Homogeneity, Global Warming, Climate Change

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PREDICTION OF MONTHLY PRECIPITATION USING ARTIFICIAL NEURAL NETWORKS AND SUPPORT VECTOR REGRESSION

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Abstract:

Precipitation is one of the most important components of the hydrological cycle. Precipitation feeds both surface and underground water resources. It is also very effective in the runoff. Extreme precipitation causes serious damage to economy and loss of lives due to flood while insufficient precipitation causes drought. Accurate precipitation estimation is crucial for planning and management of water resources. However, precipitation is a meteorological parameter that is difficult to estimate due to its complex physical phenomena. The objective of this study is to estimate monthly total precipitation by using some meteorological parameters that cover monthly average values which is measured by Turkish State Meteorological Service in 3 stations in Turkey. For this aim, different soft computing methods such as support vector machine (SVM) and artificial neural networks (ANN) were used. It was used determination coefficient (R2), root mean square error (RMSE) and mean absolute error (MAE) to evaluate performance of the models. According to the obtained results, SVM performed superior to the ANN models.

Keywords: Precipitation, Water Resources, Flood, Drought, Artificial Neural Network, Support Vector Machine

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TRANSGLUTAMINASE TREATMENTS IN CHEESE

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Abstract:

Transglutaminase (protein-glutamine γ-glutamyl-transferase, EC 2.3.2.13) (TG) is a transferase that catalyzes a covalent bond formation between glutamine residues and primary amines. TG is a natural enzyme that distributed in animal tissues and body fluids. However, transglutaminase is produced extracellularly by Streptoverticillium mobaraense and Streptoverticillium ladakanum and intracellularly by Bacillus subtilis and Physarum polycephalum and many microorganisms was determined. In 1998, Microbial Transglutaminase (MTG) was approved by the FDA (No. GRN 000095) as a "Generally Recognized as Safe (GRAS)" additive.

TG modifies the functionalities of various proteins including soy proteins, myosin, gluten, globulin, casein, whey, and pea proteins. Although milk proteins including casein and whey protein are considered as a suitable acyl donor and/or acceptor substrates for transglutaminase and this enzyme has calcium-independent activity.

The studies showed that TG can improve quality of cheese i.e. improves sensory and textural characteristics, increases yield, decrease the cheese defects in fat-reduced cheeses. According to studies, addition time and addition rate of TG and temperature in cheese production have an effective role on the textural properties, moisture content and cheese yield.

In this study, Transglutaminase treatments in cheese production and the importance of TG for cheese industry were examined.

Keywords: Cheese, Transglutaminase, Quality

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ENERGY AND EXERGY ANALYSIS OF 10 KWE SOLAR ORGANIC RANKINE CYCLE

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Abstract:

Today, while energy consumption is increasing, available fossil resources are decreasing day by day. That's why renewable energy sources is an alternative solution to meet this growing energy demand. Wind energy, biomass, solar energy and geothermal energy can be used as an alternative energy sources as well. Organic Rankine Cycle (ORC) is the ideal solution especially for low heat source systems. In this study, the ORC has been performed with the thermal energy which is collected from the parabolic trough collector. The working principle of the system has been explained and the energy and exergy analysis of the system elements have been done. A cycle model with 10 kWe installed power has made by evaporating the organic fluid in the evaporator by using the heat transfer fluid having a flow temperature of 160 °C-80 °C as inlet and outlet temperature in the cycle by using parabolic trough collector. Analysis has been done by Aspen Plus software. In this study the energy efficiency of the cycle has been found to be % 14.61 and the exergy efficiency has been found to be % 15.60 and in addition to this pump discharge pressure increases, net power output increases correspondingly. Also turbine inlet temperature increases, net power output increases correspondingly. On the other hand the cycle element with the highest exergy destruction is turbine with 3.38 kW and the cycle element with the lowest exergy destruction is pump with 0.04 kW but the energy and exergy efficiency of the ORC without IHE is respectively % 14.10 and % 15.07. When internal heat exchanger is not used, the exergy destruction in the evaporator increases due to the more irreversibly.

Keywords: Biomass, Trigeneration, Solar Energy, Orc, Organic Rankine Cycle

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SOLAR AND BIOGAS HYBRID ENERGY RESOURCES USED WITH AN EXAMPLE OF HOSPITAL BUILDING PROJECT IN TURKEY

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Abstract:

Nowadays, the obligation to use renewable energy sources is accepted by all. For this purpose, both energy saving and establishing an appropriate relation between renewable energy types and using them together in energy production have become inevitable with environmental and economical reasons. In this study, a solar energy-assisted biogas project was carried out for a hospital building in the Adiyaman city in Turkey. A concentrated solar energy application with a landfill-based biogas production and heat storage system in this area is considered. In this project, it is aimed to examine the adequacy of the potential of renewable energy sources to meet the energy needs of the hospital building. In this design, the biogas boiler system is integrated in a hybrid way to keep the system in operation during periods when solar energy is not available. The study results were evaluated in terms of reducing greenhouse gases and energy production costs, and an environmental-cost effective investment plan was sought.

Keywords: Renewable Energy, Concentrated Solar Power, Organic Rankine Cycle, Biogas

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EVALUATION OF DRY AND SATURATED P-WAVE VELOCITIES OF NEOGENE AGED SEDIMENTARY ROCKS BASED ON THE MINERALOGICAL CONTENT

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Abstract:

Ultrasonic non-destructive testing of core rock samples is practical and time consuming. Ultrasonic wave velocity provides preliminary information about the strength, deformability, fracture intensity and weathering degree of rock samples. The differences in dry and saturated P-wave velocities therefore indicate the strength reduction under saturated conditions. Saturated P-wave velocity (Psat) was argued to be higher than the dry P-wave velocity (Pdry) in previous studies. On the contrary, several researchers reported that Psat is lower than Pdry for carbonate rocks and rocks having considerable amount of clay content and fissures. In this study, the variations in Psat and Pdry for Neogene aged, intercalated carbonate and clastic rocks were correlated with the X-Ray diffraction results. In this context, thirteen core rock samples were taken from rock blocks. Physical properties and P-wave velocities were determined. The higher Psat values were observed for clastic rocks independent from the clay content, whereas lower Psat values were observed for carbonate rocks. Statistical correlations indicated that calcium carbonate, clay content and fissurity index of rock samples do not have a significant impact on the P-wave velocity difference. However, porosity and dry unit weight have negative and positive correlations with velocity difference, respectively. The main limitation of the finding is that the rock samples have inherent heterogeneity due to various size of clastic fragments and randomly oriented fissures that further affect the P-wave velocity measurements.

Keywords: Clay Content, Correlation, Fissurity Index, Neogene Aged Sedimentary Rocks Saturated P-Wave Velocity

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STRYI CITY CENTER 1 DIMENSIONAL FLOOD MODELING

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Abstract:

In this study, flood analyses of Stryi city in Lviv region of Ukraine has been modelled using HEC – RAS(River Analyses System) and GlobalMapper, GIS(Geographic information system) program. 12 cross section and 1 bridge have been defined using Stryi river network which is passing thru stryi city. Figure: Flood River Network and Cross Section Plan The photo of world with middle resolution (from 15 m/ pixels to 90 m/ pixels) and 14 band (VNIR-SWIR-TIR) screen shoot can be obtained from Aster satellite shown in the Figure above. 30x30 m pixel DEM(Digital Elevation Model) data from satellite, constructed by USA and Japan has been used. Global Mapper software, GIS modelling program supports many vector and raster file format. It can convert these data in many diffrent formats, print out and monitor with GPS(Global Positionin System). 12 cross section file have been prepared using 6,3 km long section of river. We have positioned Cross section and river network covering city area, and saved data in a excell file as x, y and height data.

HEC-RAS is a software that performs hydraulic and hydrological calculations of one-dimensional steady and unsteady currents along the river. The software calculates flood by the conservation of mass and the momentum conservation equations in one-dimensional models. The program has a river network line, cross section, cross section line defined in the hecras program. After that, the channel and collar sections of the cross section are added to the system. Maning coefficients are entered into the channel. The model is calibrated with the latest slice level and flow measurements

As a result of the model, water profile along the river, hydrographs of current and water elevation belonging to the desired maximum section flood waves were obtained. Then, the obtained data is interpreted.

Keywords: Flood,Hec-Ras,Gis,Global Mapper

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STRYI CITY CENTER 2 DIMENSIONAL FLOOD MODELING

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Abstract:

A flood simulation was carried out with the HEC-RAS (River Analyses System) for the city of Sytri in the Lviv region of Ukraine (see Figure below). HEC-RAS is hydrological and hydraulic modeling software based on Geographical Information System (GIS). In 2D flood modeling, city flood map has been obtained by Figure: 2-D flood study area. Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) with the Aster module. ASTER module provides medium resolution images of the world (up to 15m / pixel and up to 90m / pixel) with 14 bands (VNIR-SWIR-TIR). Digital elevation model (DEM) data were used in the size of 30x30 m pixels from the American Japanese co-production satellite.

The Global Mapper Software is a GIS-based model program which enables to convert, edit and print DEM data in many formats. In addition, it has a viewer supporting many vector and raster file formats and also to be followed by GPS. The 3-D image of Stryi City was analyzed with the help of demographic data.

HEC-RAS performs hydrological and hydraulic calculations of two-dimensional steady and unsteady flows along a river. HEC-RAS uses mass and momentum conservation equations of shallow water and diffusion wave. The 2D flood area was defined in geometric data editor as a polygon (2D Flow Area tool) from the plan section. This 2D flood area was divided according to the end flow method (2D Flow Area Computation Point). Simulation was executed using the parameters precipitation height, Manning coefficient and hydraulic values in two dimensional flood area.

Keywords: Flood,Hec-Ras,Gis,Global Mapper

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AN OFF-LINE PROGRAMMING FOR A 6-DOF SERIAL ROBOT (DENSO VP-6242G)

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Abstract:

Robot programming is a very important assignment in robotics. Off-line programming (OLP) is a method performed before robot manipulation. The users of the industrial robots prefer off-line programming for short run production, flexibility during operation and expecting real behaviour of the robot. Therefore, the task sequences can be planned and programmed before the real operations. The operations are visualized in many robotized processes like welding, cutting, even if medical applications. These environments are based on graphical simulation by using the models of real system. A virtual replica of the system is definitely built allowing you to program the robot from a computer. An offline program is carried out including forward and inverse kinematics of 6 degrees of freedom (DOF) serial robot manipulator (Denso VP-6242G). A Matlab-Simulink® model with SimMechanics blocks has been generated. 3D model of the Denso Robot designed by SolidWorks® has then been used for system visualization. Animations of the Denso Robot are obtained while performing tasks given.

Keywords: Off-Line Programming (OLP), Inverse Kinematics, Denso Robot, 6 DOF Robot

Gaziantep University BAP (RM.16.01)

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HIGHLY EFFICIENT REMOVAL OF CONGO RED ONTO POLY[2-(DIMETHYLAMINO) ETHYL METHACRYLATE]/PUMICE STONE HYDROGEL COMPOSITE

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Abstract:

For this study, poly [2-(dimethylamino) ethyl methacrylate]/pumice (PDMAEMA/Pmc) was prepared and its application for the adsorption of congo red was conducted by using batch adsorption techniques. As you know, congo red has negative effects on living beings include acute poisoning, carcinogen, skin toxicity, toxicity for cells, genotoxicity, necrotic properties with the ability to produce mutations related to genes or chromosome related deviations. Experimental design was used to reduce the number of experiments. Face-centered central composite design was performed by taking pH, adsorbent amount and solution concentration as independent variables. Besides, adsorption capacity was chosen as dependent variable. Thus, twenty experiments were run. It was seen that pH was the curitial factor on the adsorption capacity. Structural and morphological characteristics of the synthesized adsorbent have been evaluated by using Fourier Transform Infrared (FTIR) spectroscopy, X-ray diffraction spectroscopy (XRD) and Scanning Electron Microscopy (SEM) devices. In addition, swelling kinetics and also salt effect on swelling kinetic of the prepared polymer were investigated. The results of this study showed that the adsorption capacity of the adsorbent from the aqueous solutions was quite good and the results compared with those in the literature.

Keywords: Congo Red, Adsorption, Response Surface Methodology

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POLY (2-DIMETHYL AMINO ETHYL METHACRYLATE)/ACRYLIC ACID AS AN ADSORBENT FOR METHYLENE BLUE ADSORPTION FROM WASTE WATER

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Abstract:

In this study, we synthesized poly (2-dimethyl amino ethyl methacrylate) acrylic acid polymer, briefly, the DMA and acrylic acid mix them in the given ratio. While we dissole the BIs and APS in water. Removal of methylene blue was used for this aplication. It is known that methylene blue is a cationic dye which is hazardous in ground water . In order to reduce the number of experiments, experimentel design was used by using response surface methology. Face centred central desing was conducted with 20 experiments, for this purpose, pH, concentration and adsorbent dosage was selected as dependant factor. Acrylic acid has a carboxyl groups. In basic media acrylic acid is an negative form. Thus , there is an electrostatic interaction between methylene blue and polymer. The best pH was found as 12 for our experiments. Besides, Scanning electron microscope, XRD and FTIR analyses were done. And also, literature survey were given to compare our adsorbent.

Keywords: Acrylic Acid, Polymer, Methylene Blue, Adsorption

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REMOVING SULPHUR FROM SOMA LIGNITE COAL WITH LOW TEMPERATURE COKING AND MAGNETIC SEPARATION

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Abstract:

Lignite coals have high sulphur content for the environment standards.The sales value of a clean coal product is affected by coke ash, sulfur and calorific value.It is an environmental and technological necessity to carry out some enrichment processes so that these lignite coals can be used in industry and thermal power plants. In this study, it aimed to produce clean coal by raising quality of the coal, coal lignite with the coking in low temperature and magnetic separation processes. The total amount of sulfur in the coal was removed ratio 71 % by low temperature coking. Clean coal were produced which Sulphur have content with up to 75 % sulfur removal recovery and below 1 % from the coal after low temperature coking followed by magnetic separation.

This study, kutahya-Soma region lignite coal (-1 + 0,5 mm, -0,5 + 0,125 mm) was brought to size fractions. behind, lignite coal is coked by subjecting to low temperature coking at different temperatures (600-550-500 ° c) and for different times (15-30-60 minutes) and then lignite coal is fed to high field intense magnetic separator to remove ash and sulphide.

Keywords: Keywords: Coal, Low Temperature Coking, Removel Of Sulfur, Magnetic Separation

*coal

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OPTIMIZATION OF TAHINI RATES IN THE PRODUCTION OF MILK SUPPLEMENTED WITH TAHINI

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Abstract:

Tahini is a very popular product in the Eastern Mediterranean countries such as Turkey, West Asia and the Middle East. Tahini is produced by cleaning sesame seeds, peeling their shells, roasting and then grinding in the mills. Tahini contains high fat, protein, fiber, minerals and vitamins. Tahini is mostly used for making halva in Turkey. It is also consumed with hummus meal made from chickpea, pumpkin dessert, ice cream and breakfast with molasses. Increasing population growth and economic developments in the world increase novel product consumption and demand. The production and variety of milk in Turkey is also an increasing interest. Therefore, there is a necessity for products that children could consume during winter times.

In this study, milk supplemented with different ratios of tahini were examined for the color and sensory properties. Semi-fat milk, tahini, sugar and stabilizers (carrageenan and guar gum) were used as the materials. The mixtures were prepared by adding semi-fat UHT milk, tahini (6%, 8%, 10%, 12% and 14%), sugar (10%) and stabilizers (carrageenan 0.015% and guar gum 0.1%) and then homogenized. The mixtures were initially treated at 90 ºC for 20 minutes and then re-homogenized for 3 minutes. Five different milk supplemented with tahini were cooled to 25 ºC. The color values (L, a and b) of the samples were then measured. According to the results, it was determined that addition of different ratios tahini into milk affected the L, a and b values ($p<0.05$). In addition, sensory evaluation by the panelists determined that addition of different ratios of tahini into milk also affected the color, consistency, taste, smell and other properties as well ($p <0.05$). As a result, the panelists preferred the milk with10% tahini. It could be therefore suggested for producing milk with 10% tahini.

Keywords: Milk, Tahini, Sugar, Tahini Milk, Sensory. Color

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ANALYTICAL DAMAGE ESTIMATION OF AN EXISTING RC BUILDING SUFFERED A SHEAR WALL DAMAGE USING LINEAR AND NONLINEAR METHODS

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Abstract:

One of a shear wall of a governorship building, in Turkey, was suffered damage suddenly for an unknown reason. Shear wall was strengthened immediately after the damage. Design of structures and estimation of behavior of structures are conducted using analytical methods and it is important to estimate the reliability and approximation of the analytical methods. In general there are two analytical methods as linear and nonlinear. In this study, the existing damaged building were analytically modelled via SAP 2000 and investigated if the damage could be estimated with using traditional linear and nonlinear analytical methods. Considered building is an RC building and has lack of reinforcement with low concrete compressive strength. Concrete compressive strength is 14 MPa and yield strength of reinforcement is 220 MPa. First of all earthquake loading was applied considering design spectrum which is given in Turkish Seismic Code 2007 using linear elastic method. Section shear forces were estimated for design spectrum and compared with the capacity of shear wall. Secondly, nonlinear time history analysis was conducted for 3 ground motion records and occurring of same damage was investigated, too. Ground motion records were scaled to design spectrum to estimate the same hazard with linear elastic method. Ground motion records were selected considering two criteria as distance from the source of rupture to minimize the near fault effect and soil class. According to the results, not only damaged shear wall but also other shear walls suffered damage under the effect of design earthquake for linear and nonlinear methods. If building were designed according to a modern seismic code it is obvious that existing damage would not occur.

Keywords: RC Building, Shear Wall, Damage, Linear Analysis, Nonlinear Time History Analysis

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IMMOBILIZATION OF CELLULASE ON MAGNETIC NANOPARTICLES

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Abstract:

Immobilization is the attachment of enzymes to a support material and thereby enable enzyme re-use. Recycling of immobilized enzymes can be difficult from the medium in which insoluble substances are present. In recent years, there has been an increasing growing interest in the use of magnetic nanoparticles as support material in enzyme immobilization.

In this study, covalent immobilization of cellulase enzyme complex was carried out by using magnetite (Fe3O4) as support material synthesized by co-precipitation method. The synthesized magnetic nanoparticles were coated with silane to stabilize the magnetic nanoparticles (A-MNP). Magnetic particles coated with APTES were activated with glutaraldehyde (G-MNP) followed by cellulase enzyme immobilization (E-MNP). SEM, EDX, FTIR analyzes were used for the characterization of MNP, A-MNP, G-MNP and E-MNP. The approximate size of MNPs was found to be 200 nm. Maximum activity of free and immobilized cellulase enzymes was determined at 70 °C. The optimum pH values were 5 and 4.8 for immobilized enzyme, and free enzyme, respectively. Residual enzyme activity was determined as 29.9 % and 38 % for free and immobilized cellulase enzymes, respectively, after 5 hours at 60 °C. The cellulase activities were measured at different substrate concentrations. Km-Vmax values were calculated as 155.25 mg/ml-2500 µmol/ml.min and 23.64 mg/ml-108.69 µmol/ml.min for free and immobilized cellulase enzyme, respectively.

Keywords: Immobilization, Cellulase , Magnetic Nano Particle

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ANTIMICROBIAL EFFECT OF SILVER NANOPARTICLES IN CARBON FILTERS

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Abstract:

Activated carbon filters (ACF), for using to remove chlorine, are a nutrient rich media and relatively stagnant environment. ACF's surface, which is not found chlorine, is suitable for microbial growth. Bacterial endotoxins, which are the result of the breakdown of cells in medical applications, present significant risks. The nano-scale particles are promising candidates to fight against bacterial growth.

The antimicrobial effect of silver has been known for long time. Metallic silver and silver oxide particles having antimicrobial effects are being used for different purposes. Microbial growth on the surface of the GAC modified with silver oxide particles can be inhibited.

In this study, the preliminary treatment unit used in the dialysis units was modeled and microbial contamination was continuously monitored in the system. Both the modified and the untreated activated carbon filter were investigated comparatively in the continuous system for 240 days. pH, conductivity, chlorine, microbial contamination and endotoxin analysis were performed at specific time intervals.

It was determined that the modified carbon filter with 0.04% and 1% silver oxide decrease the microbial growth by 64 and 83%, respectively, compared to the untreated activated carbon filter. The decrease for endotoxin was limited. 35 % reduction was detected in the activated carbon filter containing 1% CuO particles. It was also determined that the silver oxide particles were separated from the activated carbon surface in significant amounts.

Keywords: Antimicrobial Effect, Activated Carbon, Lead Nanoparticles

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A NOVEL SCREW TYPE PYROLYSIS SYSTEM TO SELECTIVELY PRODUCE THE VALUABLE CHEMICALS FROM LIGNOCELLULOSIC BIOMASS

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Abstract:

Pyrolysis process is widely researched for thermal conversion of lignocellulosic biomass. In a few last decades, screw type (Auger) pyrolysis reactors is evaluated more advantageous one by the researchers because of their continuous and compact designs. Simply, classical screw pyrolysis reactor system is consisting of a feeder, an Archimedes screw, tubular reaction zone heated indirectly, char collection pot and gas condensing system. In classical system, a liquid product is obtained by condensing from pyrolysis gas coming from outlet of reactor. This liquid product mainly contains organic acids, aldehydes, phenols, furans, pyrolytic sugars, guaiacols, catechols etc.. Besides the using as a fuel, liquid pyrolysis product can be considered as a source for these chemicals. But it is needed detailed separation and purification processes to obtain specified chemicals due to its complex structure. Pyrolysis of lignocellulosic biomass is a complex thermochemical process which is strongly dependent on the temperature. The decompositions of the lignin, cellulose and hemicellulose are strongly temperature sensitive phenomena. For that reason, a new screw type reactor design was developed to obtain liquid pyrolysis products selectively in this study. The new design has different temperature zones (five zones) and pyrolysis gas ports on the tubular reactor. In this way, it has been thought that a selective pyrolysis of the biomass can be realized to obtain some rich liquid products for specific chemicals. In the submitted part of the study, the results of the experiments conducted to maximize liquid product amount were given. To the maximize liquid product yield, effects of some parameters such as feeding rate, screw rate and temperature profile were studied by the experiments designed with Response Surface Methodology (RSM). By fixing the maximum temperature at the end of tubular reactor is to be 550◦C, the conditions for maximum liquid product yield were determined as feeder driver gauge value of 21.35, screw driver gauge value of 37.68 and ΔT value of 65.47◦C (T1= 288.12◦C, T2=353.59◦C, T3=419.06◦C, T4=484.53◦C and T5=550◦C). Under these conditions, liquid, solid and gas product yields were obtained as 57.07 %, 16.40 % and 26.54 %, respectively.

Keywords: Biomass, Pyrolysis, Screw Reactor, Auger, Novel Design

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AN INVESTIGATION ON THE EFFECT OF SOME PRETREATMENTS TO OBTAIN LEVOGLUCOSAN-RICH BIO-OIL FROM PINE SAWDUST IN SELECTIVE SCREW TYPE PYROLYSIS SYSTEM

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Abstract:

Levoglucosan (1,6-anhydro-□-D-glucose) is an anhydro-sugar could be obtained from decomposition of cellulose during the fast pyrolysis of the lignocellulosic biomass. Levoglucosan which is a polar substance can be converted to glucose by a simple acidic hydrolysis procedure. For that reason, pyrolysis as a thermal conversion process is widely researched to produce pyrolytic sugars from lignocellulosic biomass in last decades. The condensed liquid pyrolysis product has a complex structure due to containing organic acids, aldehydes, phenols, furans, pyrolytic sugars, guaiacols, catechols etc.. These chemicals can be considered as valuable substances but separation of them from bio-oil and their further purification need difficult and costly operations. In the earlier studies, alcohol fermentation of glucose obtained from pyrolytic sugars being in pyrolysis oil was widely investigated. For this purpose, firstly, bio-oil containing pyrolytic sugar in high concentration must be obtained. It has been reported that the removal of alkaline metals from lignocellulosic biomass can be enhanced levoglucosan concentration in the earlier studies. In this study, effects of some pretreatments on the levoglucosan amount during pyrolysis of pine sawdust in novel selective pyrolysis system were investigated. For this purpose, pine sawdust was pretreated with water, phosphoric, sulphuric and acetic acid and zinc chloride solutions by boiling. Pretreated sawdust samples were pyrolyzed under the optimized conditions for maximum liquid product yield to obtaine the levoglucosan-rich bio-oil. The comparative experiments showed that the most suitable pretratment agent is phosphoric acid. The results showed that the levoglucosan was condensed in the liquid products which are came from 354, 419 and 484°C of temperature zones. The amounts of these three liquid products was equal to about 50 % of total liquid bio-oil. The levoglucosan concentration of the bio-oil obtained by mixing these three liquid products was about 139 g/kg.

Keywords: Pine Sawdust,

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DRYLAND AFFORESTATIONS IN THE CENTRAL PART OF TURKEY

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Abstract:

The Central Anatolian Region of Turkey has vast dry lands with degraded vegetation cover for long-term human and animal disturbances. The main challenge facing the foresters and land managers in the region is to prevent the soil loss subject to wind-erosion. The afforestation practices has been conducted in the region for 70 years, We analyzed afforestation sites in 51 locations spread in dry lands of Central Anatolia across more than 10 000 km2 from the east of salt-lake to the West of Eskisehir province and to the South of Karaman province. About 77 % of the total 43 000 ha afforestation sites were established with the techniques used for productive forest. Only 22 % of these sites were established for the purpose of erosion control. Even in erosion control sites the practices are mainly focused on tree species. A few shrub species such as Calligonum polygonoides, Spartium junceum, Atriplex hortensis, Rosa canina and Tamarix ssp. are used in limited amounts scattered in afforestation sites. As conclusion, the results that have been obtained so far are limited to the interpretations made about the tree species. In order to accelerate the process of successful ecosystem restoration in these degraded and harsh environments new experimental studies focusing on both above and belowground processes are needed.

This study was funded by TUBITAK (The Scientific and Technological Research Council of Turkey) through project no: 112O946 “Kurak Bolge Bitkilendirmesinde Farkli Agac, Cali ve Otsu Turler Kullaniminin Fidan Buyumesi ve Beslenmesi ile Bazi Toprak Degiskenlerine Etkisi”

Keywords: Afforestation, Dry-Lands, Central Anatolia, Erosion-Control

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5TH YEAR RESULTS OF ARIDLAND AFFORESTATION IN CENTRAL ANATOLIA, TURKEY

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Abstract:

The afforestation of arid lands faces many challenges, and perhaps the most important key for success is choosing one or more species that are adapted well for local environmental conditions. We explored species that would be suitable for the steppe region of Central Anatolia. Intensive site preparation included ripping the subsoil (to 80 cm) and plowing the upper soil before planting seedlings of Elaeagnus angustifolia, Robinia pseudoacacia, Fraxinus angustifolia and Pinus nigra were used as tree species.

After 5 growing seasons E.angustifolia showed the highest survival, with 80% of planted seedlings remaining. Broadleaved trees grew a cumulative average of 34 cm in height in five years. E. angustifolia showed faster height growth with larger crown-with. Whereas P. nigra seedings grew only 9 cm. Overall, E.angustifolia appeared best suited tree species for afforestation in these areas. R. pseodoacacia and F. angustifolia may also be used as alternative species. Though the results obtained from these studies are important, the more meaningful results are thought to be likely to occur in the later years of afforestation.

This study was funded by TUBITAK (The Scientific and Technological Research Council of Turkey) through project no: 112O946 “Survival, Growth and Nutritional Status of Different Tree, Shrub and Herb Species and Their Effects on Some of the Soil Properties in the Central Arid Region of Turkey (Kurak Bolge Bitkilendirmesinde Farkli Agac, Cali ve Otsu Turler Kullaniminin Fidan Buyumesi ve Beslenmesi ile Bazi Toprak Degiskenlerine Etkisi)”

Keywords: Arid-Land, Afforestation, Plant Nutrition, Soil Productivity

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FLOOD ANALYSIS OF A PART OF DICLE (TIGRIS) RIVER BY HEC-RAS PROGRAM

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Abstract:

Floods are seen as the greatest natural disaster in the worldwide after earthquakes. Especially country like Turkey, as well as in terms of both climate and geographical features changing in a short distance, flood is the most decisive parameter in the localization planning. Especially in the case that permeates every aspect of life are increasingly, the Geographic Information System is use with flood plain analysis. In this study, the floodplain analysis of Dicle (Tigris) River between Sadi Bridge located on Diyarbakir-Silvan highway and the historic ten-eyed Bridge with the symbolic value were performed. There is also the Hevsel Gardens, which was taken to the World Cultural Heritage List by UNESCO in 2015 on this route. Different cross-sections are taken from the map of the study area with AutoCAD Civil 3D program. After transfer these cross-sections to the HEC-RAS (Hydrologic Engineering Centres River Analysis System), one-dimensional floodplain analysis of Dicle River is obtained. In addition to this, crossing structures (bridge) on the route were also analyzed and tried to determine the places where the flood risk was determined and their effects.

Keywords: Flood, Dicle River, Hec-Ras, Hevsel Gardens

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DEVELOPMENT OF OFF-SHORE WIND ENERGY IN TURKEY

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Abstract:

Wind energy is one of the renewable energy sources that is becoming more and more popular every day. Wind turbines are used to make use of wind energy. Wind turbines convert kinetic energy from the wind into mechanical energy first, and then convert it to electrical energy. Turkey wind power installed capacity of 51 MW in 2006, while in 2015 4718.3 MW a rose. The ratio of wind energy to total electricity demand is 4.4%. Turkey's wind energy potential of 48 000 MW. If all potential is used, 44% of the total electricity need can be met by wind power plants. For the first time in Turkey's renewable wind energy projects at sea, with maximum winds of the Aegean Sea it is among the world's regions with the potential to stand out. Usually at a depth of 20-50 meters off-shore plants established in the first example, when considering Turkey's seas "near the sea" as it is stated that the realization gained weight. As previously off-shore wind power plants yet to be done in the absence of pristine sea locations in Turkey in the ocean depths, is seen as a factor that will reduce costs. The Aegean Sea stands out among the regions with the most wind potential in the world. Turkey has a very high off-shore wind potential and has a capacity of 32 thousand megawatts power plant can be established. In the Aegean region, especially the areas within the continental landscape of Bozcaada and Gokceada openings, the Canakkale region and the Black Sea coast of Saros Gulf and Trakya have serious off-shore potential. At present, 13 percent of the electricity generated from wind in Europe is provided by off-shore power plants. The off-shore power plants are increasing in installed capacity and falling in costs.

Keywords: Wind Energy, Renewable Energy, Off-Shore, Turbines

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INVESTIGATION OF DEGREDATION KINETIC OF ANTHOCYANINS IN RED MEAT RADISH

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Abstract:

Radish (Raphanus sativus L.) is a rich nutrient-rich vegetable with an important place in meeting people's need for fresh vegetables and belongs to the cruciferaous vegetable family. There are significant amounts of anthocyanins in the composition of red meat radish. Anthocyanins are water-soluble natural coloring substances that form a variety of colors of fruits, vegetables and flowers as pink, red, viole, blue and purple tones. Anthocyanins have beneficial effects in reducing heart-related diseases, anti-cancer activity and many health benefits. The acceptability of a product depends on its color characteristics. The color of food is one of the most important quality parameters affecting the consumer. Since color is the first noticed characteristic of foods, consumers are evaluating the quality of a food product by looking at the color. The color of a food is also influential for perception of its flavor, taste and texture. The most important factor that causes the anthocyanins to break down is temperature. The high temperature applied whether during storage or product is processed causes the anthocyanins to break down. The aim of this work is to examine the effect of temperature on the anthocyanins in red meat radish and the kinetics of the degradation of the anthocyanins. For this purpose, radish juice was obtained from red meat radish and stored at 25, 50 and 75 ºC for 84 hours and the amounts of anthocyanins in the samples were determined. As a result of the investigation, it was determined that the anthocyanins well fit first order kinetic model and the R2 values ranged from 0.928 to 0.956. The activation energy was calculated using the Arrhenius model and was determined to be 3863.58 Joule / mol. The rate constant (k) of the anthocyanins was determined as 0.022 1/hour, 0.029 1/hour and 0.036 1/hour at 25, 50 and 75 ºC, respectively.

Keywords: Anthocyanin, Kinetic And Red Meat Radish

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MAGNETIC LEVITATION SYSTEM ANALYSIS

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Abstract:

Magnetic levitation is one of the most commonly used control systems for education purposes. As it is unstable in open loop configuration, students can easily understand the need for a close loop control system. Due to the fact that Maglev trains are becoming popular, they can also accept the importance of the presented model. There are however many variations of this system. The feedback can for example be obtained either by an optical sensor or with a sensor sensing the magnetic field. In the latter case a single sensor can be used or a pair of sensors in order to cancel the effect of the filed generated by the coil. In this paper various Matlab/Simulink based models of the magnetic levitation system are designed and all possible implementations are compared. The behavior of the closed loop control system is then analyzed using linear approximations of the previously developed Matlab/Simulink model. The discussion of the appropriate control algorithm is added as well.

Keywords: Magnetic Levitation, Control Systems, Linearization

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EFFECT OF BIOCHAR USE ON SOME PHYSICAL CHEMICAL AND BIOCHEMICAL PROPERTIES OF SOIL

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Abstract:

The use of biochar in agricultural practices improves the availability of plant nutrients by regulating some physical properties of the soil and helps to ensure water balance. It can also act as a soil conditioner promoting plant growth by improving the physical and biological properties of the soil. In this study, the effects of biochar use in agriculture on some physical, chemical and biochemical properties of soils and the growth of lettuce (Lactuca sativa) were investigated. The trial was conducted in two stages. In the first stage, the biochar was obtained, while the second stage was in the pot experiment. Economically unavailable reeds (Arundo donax) were harvested around Aydin province and biochar was obtained by prolysis. Biochar was sieved from two different sieves and two different sizes (<2 mm and 2-4 mm) were created. The biocar at two different sizes was applied to the sandy loam soil as 10-20-30 ton ha-1 to pots. At the end of the experiment, pH, total salt, texture, organic matter, cation exchange capacity, hot water soluble boron, soluble potassium, soluble phosphorus, CO2 production and dehydrogenase enzyme activity (DHG) were analyzed in soil samples. According to the analysis and research results, it was determined that the amount of application of biochar material applied to soil is more effective on physical, chemical and biochemical properties of soil than size of biochar material. In the growth of lettuce (Lactuca sativa), the effect of bichar at less than 2 mm was found to be more positive and 30 ton.ha-1 is more effective in soil properties.

Keywords: Biochar, Soil, Particle Size, Cation Exchange Capacity, Dehydrogenase Enzyme Activity

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ACOUSTIC IMPROVEMENT DESIGN: UNIVERSITY CONFERENCE HALL

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Abstract:

Auditory comfort condition has a vital importance in daily life. Especially, the intelligibility of speech is one of the basic parameters of auditory comfort condition. This research interested in speech intelligibility in conference hall building. This study focuses on the improvement of conference hall acoustics of the building which is located in Turkey. First step of this study, acoustic evaluation of existing conference hall is performed and determined necessity of acoustic improvements. Second step of this study, acoustic improvement project is developed to generate good acoustic environment in conference hall. Acoustic improvement project is carried out based on main decisions which are changed surface sound absorption properties. Acoustic project is included not only improvement of audience visual aspect but also increased sound quality of room as well. Finally, reverberation time is controlled with acoustic project in order to provide speech intelligibility in conference hall building. Research has been shown the importance of reverberation time control and acoustic improvements decisions.

Keywords: Room Acoustic, Auditory Comfort Condition, Speech Intelligibility And Reverberation Time Analysis

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A NEW ENERGY CONVERSION SYSTEM DESIGN WITH VERTICAL HYDROKINETIC TURBINE WITH FIXED ROUTER WING

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Abstract:

River applications have an important place in electricity energy production. In this study, a new hydrokinetic energy conversion system with vertical axis turbine was designed to meet the electricity needs of the rural residents by utilizing water flow energy for river applications. The system was built on the idea that it could be extended to the river beds by making channels such as special mill waterways. At the designed channel inlet, the flow rate is adjusted by means of the pump with the number of revolutions set and the special flow channel. This brings some simplifications to the generator and automation systems. With the construction of hydrokinetic flow channels, friction and impact losses caused by the construction of river beds have been somewhat avoided. The hydrokinetic turbine with vertical axis fixed vertical wings is composed of hydrokinetic channels similar to the river beds which includes groups of DC generators, rectifiers, battery banks and inverters, mechanism of increasing the number of revolutions. This system utilizes the kinetic energy of the flowing water and produces electricity in a controlled manner. The obtained data are transferred to the computer environment and the system dynamics and data are examined in detail in the MATLAB / Simulink environment.

Keywords: Hydrokinetic Turbine, DC Generator, Inverter, Battery Bank

[*]*This study is supported by Scientific Activities Support Program of Giresun University*

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PMDC MOTOR SPEED CONTROL WITH FUZZY LOGIC CONTROLLED ZETA CONVERTER

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Abstract:

In recent times, Zeta converter applications have become widespread due to the simplicity of installation, low cost and high efficiency. Most of the researches on DC converters focus on such issues as the determination of the control system that most effectively controls a selected physical system and the comparison of system stability. In this study, a designed zeta converter is used in the MATLAB / Simulink program performance has been studied. In addition, it has been investigated the performance and performance of a Permanent Magnet DC motor connected to the output of this Zeta converter by proportional integral (PI) and fuzzy logic control (FLC) methods of performance analysis. Fuzzy logic control The simulation model required for the Zeta converter and DC motor system was created in Matlab / Simulink program. The effects of the electrical outputs generated by the system, especially the motor speed parameters, on stability and efficiency were investigated.

Keywords: Power Electronics Converters, Zeta Converter, Fuzzy Logic, Pmdc Motor, Speed Control

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THE HABITAT SELECTIVITY OF LACEWINGS IN THE EASTERN MEDITERRANEAN OF TURKEY (NEUROPTERA: PLANIPENNIA)

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Abstract:

Most of lacewings are potential control agents with great potential to be use in the biological control of agricultural pests, field crops, greenhouse, orchards, parks and forests. The larvae (Chrysopidae, Myrmeleontidae, Coniopterygidae) are predators of small, comparatively soft-bodied arthropods such as aphids, whiteflies, insect eggs, thrips, and other prey. In this study, in order to determine the habitat selectivity and seasonality of lacewings in the Eastern Mediterranean of Turkey (Neuroptera:Planipennia), assemblages were monitored in five different habitats. A total of 322 adults (Neuroptera:Planipennia) representing 12 species of lacewing specimens belong to 4 families were collected during May-October 2017. Principal component analysis (PCA) and cluster analysis indicated that there is a distinct clustering on the lacewing populations. The results demonstrated that the PCA and cluster analyses were useful to improve the knowledge of occupancy and spatial distribution of lacewing assemblages. The results also demonstrated that clustering points, including neighbour joining could be more appropriate for determining the habitat selectivity of lacewings.

Keywords: Neuroptera, Lacewings, Habitat Preference, Biodiversity, Eastern Mediterranean Of Turkey.

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EFFECT OF ENGOBE PERMEABILITY ON WATERMARK PROBLEM OF CERAMIC WALL TILES

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Abstract:

Ceramic wall tiles are described as having high porosity and high water absorption (> % 10) products commonly preferred for internal applications. After the laying of ceramic wall tile, the ceramic body absorbs the water. This absorbed water appears as watermarks on the ceramic wall tile surfaces. Watermark is one of the major complaints of the ceramic wall tile producer. In order to solve this problem, it is necessary to understand the watermark formation phenomenon. The objective of the present work is to develop waterproof engobe compositions to avoid watermarks in porous ceramic wall tiles by adjusting the fusibility of the engobe. For this purpose, starting from the standard engobe composition, different type and amounts of frits were added into the system. While frit amounts were increased in the engobe formulations, kaolin and alumina ratios were reduced. The water absorption of the sintered engobe compositions was measured by a water displacement method according to ISO 10545-3 standard. The structural and morphological characteristics of the engobes were determined by a heating microscope, X-ray diffraction (XRD) and scanning electron microscopy (SEM). This study revealed that watermarks observed when the engobe permeability is high. Increasing engobe fusibility prevents the watermarks formation. The permeability of engobe layer decreases as the content of glassy phase increases and the content of porosity decreases.

Keywords: Engobe, Permeability, Watermarks, Ceramic, Wall Tile

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INVESTIGATION ON THE MECHANICAL PROPERTIES OF USING LOCAL CLAY INSTEAD OF UKRAINE CLAY IN PORCELAIN TILE BODY

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Abstract:

Porcelain tiles are one type of vitrified tiles with water absorption less than 0.5 %. Due to its high mechanical properties and remarkable resistance, porcelain tiles are the natural choice of ceramic material for floors and walls. The raw materials mainly consist of clay and kaolin minerals mined from the earth's crust, natural minerals such as feldspar that is used to lower the firing temperature. The clays used in the porcelain tile bodies are mainly supplied from Ukraine. The Ukraine clays are preferred because of its whiteness and high plasticity. The aim of the study was to investigate the usage of local clay (Afyon/Turkey) instead of Ukraine Clay and effect of on the mechanical properties of porcelain tile bodies. Due to its moderate to high plasticity properties and the proximity to the most important areas of Turkey's ceramics industry, Afyon clays have been intensively used for the last few years. In this study, the ratio of Ukraine clay used in porcelain tile body was decreased as 4%, 5%, 7% and 10% and local clay was used in as some ratios instead of Ukraine Clay in porcelain tile body. The compositions were prepared with traditional ceramic tile production processes and fired under industrial fast firing cycle at 1200°C-55 min. Physical (water absorption, firing shrinkage, color values) and mechanical (bulk density, dry strength, firing strength) properties of the developed bodies were tested. Thermal expansion coefficient values of the bodies were determined by dilatometer. According to the results, it was found that decrease of Ukraine clay and addition of local clay increases the water absorption and firing shrinkage values of bodies. Strength values of the bodies show a tendency to decrease with increasing amount of local clay. In addition, thermal expansion coefficients of the bodies are also increasing with using of Afyon clay.

Keywords: Porcelain Tile, Ukraine Clay, Local Clay, Mechanical Properties

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AN IMAGE PROCESSING METHOD FOR AUTOMATIC COUNTING OF SPERM CELLS FROM MICROSCOPE IMAGES

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Abstract:

Infertility is worldwide problem, although there is not a certain data for prevalence of infertility globally, most studies show that 15% of couples in reproductive age has infertility problems. It is estimated that almost half of infertility problem is because of male factor. There are several factors affecting infertility of males and one of the important problem is low concentration of sperm. Therefore semen analysis and counting are routine laboratory tests and become a growing industry. The common used method for evaluation of sperm numbers is manual and developed in 20-30 years ago. Since it is manual it is time consuming, the results are usually depends on specialists and not reproducible. Computer aided semen analysis systems are a promising approach for fast, accurate and reliable semen analysis. In this paper we proposed an image processing method for sperm counting from microscope images. The samples are pipetted in to hemocytometer, without any preprocessing which used in manual counting. Preprocessing usually degreases the accuracy. After samples ready, multimedia images are taken under microscope. The image processing method based on background subtraction to distinguish sperms and using adequate thresholding sperm heads are segmented and counted automatically. The true positive rates are over 90% and false positive rates are below 5% for images. According to manual assessment the method is not relative, reproducible and more accurate.

Keywords: Infertility, Sperm Analysis, Automatic Sperm Counting, Image Processing

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UTILITY OF CERAMIC WASTE AS FILLER IN ASPHALT CONCRETE

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Abstract:

The rapid developments in the field of industry and technology causes the degradation of natural balances. Human activities on earth produce in considerable quantities of wastes more than 2,500 million tons per year. The vast quantity of waste materials accumulating throughout all over the world is creating costly disposal, health, also the land filling and serious problems to the environment. There are many types of waste material found in the world like industrial, building, household, agricultural etc. For the past years, there were studies to incorporate some of these waste materials into asphalt concrete.

In this study, the ability of ceramic waste materials as filler to improve the mechanical and phisical properties of asphalt concrete was investigated. Firstly, asphalt mixture samples were produced using as 4.5%, 5%, 5.5%, 6%, and 6.5% bitumen to determine the optimum bitumen content. Marshall Stability (MS) test was applied on prepared samples which are used with different ratio of limestone filler. After, the mechanistic properties of asphalt concrete mixes modified with ceramic waste as a replacement for limestone dust mineral filler were evaluated. Four replacement rates were used for mineral filler; 25, 50, 75 and 100 % by weight. Asphalt concrete mixes were prepared at their optimum asphalt content and then tested to evaluate their engineering properties which the density, air voids (Vh), voids in the mineral aggregate (VMA), voids filled with asphalt (Vf), Marshall Stability (MS) and flow values (FW) of each sample.The experimental results, in general, showed that the mixes modified with ceramic waste were found to have improved high stability and suitable phisical properties. The use of 50 % of ceramic waste filler has shown a significant improvement in asphalt concrete behavior.

Keywords: Waste Material, Ceramic Waste, Filler Material, Asphalt Concrete, Marshall Stability,

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EFFECTS OF DOPED ATOMS ON THE STRUCTURAL, ELECTRONIC AND OPTICAL PROPERTIES OF A CARBON NANOTUBE

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Abstract:

The photophysical, structural, optical properties and electronic structure of a pure carbon nanotube (CNT) and Si, Ni, B and N-doped CNTs have been performed using density functional theory (DFT) approach. We present a comparative analysis to demonstrate how the dopant atoms interact with an armchair CNT. The geometrical properties, lowest harmonic frequency, total energy, dipole moment, Mulliken atomic charges, formation energy, HOMO-LUMO gap, optical refractive index and density of state spectra are analyzed using DFT. The optical absorption spectra are also researched based on TD-DFT method. From the obtained results, the bond distances and the corresponding properties exhibit remarkable variations based on the type of the dopant atom. Si and Ni atoms was found to considerably reduce the band gap of CNT. The effect of dopant atoms is quite pronounced in enhancing the electronic and optical absorbance properties of the pure CNT. The present work might be useful the understanding of the properties of doped-CNTs for the designing new nano electronic-devices.

Keywords: Carbon Nanotube; Electronic Structure; Bandgap; Refractive Index, Dft

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UNUSUAL STRUCTURAL PHASE TRANSITION PROPERTIES OF GAAS CLUSTERS UNDER PRESSURE

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Abstract:

The structural and electronic properties of the cubic zinc blende structure of GaAs clusters under pressure have been investigated using ab initio approach. Two model with different compositions are performed. In order to determine the phase transition for model 1 and 2 structures of GaAs clusters, the pressure-volume relation is obtained by using the constant pressure ab initio simulation. A sharp change is observed in volume as the pressure increases from 30 GPa to 40 GPa for model 1 and from 60 GPa to 70 GPa for model 2. These results indicate that a first order pressure induced phase transitions in GaAs. These phase transitions are also analyzed from the total energy and enthalpy calculations. Moreover, we calculated some geometrical properties such as radial distribution functions (RDFs), coordination numbers depending on probability distribution and order parameter to analyze the distribution of the different types of atoms based on pressure in the binary clusters.

Keywords: Structural Phase Transformation, Ab Initio Molecular Dynamics, Gaas

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INVESTIGATION OF BIOETHANOL PRODUCTION FROM WHEAT WASTES

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Abstract:

It is known that fossil fuels cause global warming, ie climate change, mainly caused by greenhouse gas formation, that is, the increase of methane and carbon dioxide gas especially in the atmosphere. Besides, the reserves of fossil fuels are decreasing while industrialization is rapidly increasing with population increase. For these reasons, the need for and importance to alternative energy sources is increasing both in the world and in our country. In this study, bioethanol production, which is mainly used for motor vehicles and for different purposes, is preferred due to its high energy capacity and low cost. Wheat waste will be studied with fermentation process together with other agricultural wastes or alone .Benefit cost analysis will be carried out on the results obtained and /or literature values and the effect of these wastes assessed in the Central Anatolia Region on the regional and country economies will be calculated and a pilot facility will be proposed for the university if possible.

Keywords: Biomass, Agricultural Waste, Wheat Waste, Bioethanol, Energy

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REVIEW OF METAL WORKING INDUSTRY WASTEWATERS TREATMENT METHODS USING MEMBRANE SYSTEMS

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Abstract:

Due to the increase in environmental pollution resulting from industrial activities and the depletion of natural resources, businesses are increasingly responsible towards the environment. Industrial wastewaters may be lower in volume, but contain higher concentration of pollutants. The emissions in the metal working industry are commonly used to prolong tool life, to prevent corrosion, to cool and to increase their efficiency. The chemical structure and toxicology of these liquids are quite complex. The contact of these liquids with skin and the inhalation of them with air cause harmful effects on human health.

The methods used in the treatment of waste water are based on the separation of the water phase and the oil phase, and then each phase is treated independently. Hybrid processes (biological and physical processes) can also be used as well as biological treatment with different treatment techniques to treat contaminated water. However, there is little information on the treatment of metal working wastewaters. In recent years, membrane separation techniques (microfiltration, ultrafiltration, nanofiltration and reverse osmosis) have been investigated to treat metal working wastewaters due to the process efficiency and high exit water quality . In this study review of membrane processes for treatment of metal working industry wastewaters will be investigated.

Keywords: Indutrial Wastewater, Metal Industry, Membrane, Toxic

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THE RELATIONSHIP AMONG ECOSYSTEM VARIABLES AND PHYSICAL AND MECHANICAL PROPERTIES OF EASTERN BEECH (FAGUS ORIENTALIS LIPSKY) WOOD GROWN IN THE WESTERN BLACK SEA REGION OF TURKEY

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Abstract:

Eastern beech is one of the most important wood producing species in Turkey with accounting 20 % of the Turkey's total wood production. Thus, the aim of this study is to investigate the relationships among ecosystem variables and beech wood's physical and mechanical properties.

Research site is located in an eastern beech site located in western Black Sea region of Turkey. The sites have about yearly 9 C0 average temperature with 1200 mm annual precipitation. Above ground canopy is mostly comprises eastern beech with the mixture of about % 10 chestnut (Castanea sativa). For the study 6 sites along the elevation and from changing site aspect were selected. For the each site 3 trees without any default and 100 m apart from each other were marked on tree directions. Then trees were fallen-down with a chain saw and carried to the mill and laboratory for the measurements.

Elevation, aspect, slope etc. were recorded for each sapling site. The soil and forest floor organic matter were sampled. Data were analyzed for the correlation among site properties, soil, forest floor's and wood's mechanical and physical properties.

Data revealed that slope and radial strength are negatively, elevation and volume shrinkage are positively, soil acidity and wood's lateral strength are negatively correlated. Besides forest floor N concentration is negatively related to wood tangential strength, tangential expansion, volume expansion, volume shrinkage and shock resistance.

Keywords: Easter Beech, Wood Properties, Turkey

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INVESTIGATION OF THE SOLVENT EFFECT ON THE VISCOSITY OF POLYVINYLPYRROLIDONE SOLUTIONS

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Abstract:

Polyvinylpyrrolidone (PVP) is a synthetic polymer used in the dispersion and suspension of drugs. It is also used as plasma volume enhancer in trauma patients, binder for tablets and capsules, film former for solutions, and adhesive for transdermal systems. The conformation of the PVP chains in aqueous solutions is random. The coil size which is the measure of hydrodynamic volume can range from 1 to 100 nm depending on the molecular weight,. The dimensions are important for medical applications. Capillary viscosimetry is the simple and useful technique for determining of hydrodynamic volume of polymers in solutions.

In this study, the viscosities of PVP (molecular weight 1300000 g/mol) solutions were determined by capillary viscometry in water-dimethylformamide-methanol and mixtures at certain ratios of water / dimethylformamide (30/70-50/50-70/30 volume fraction), water / methanol (30/70-50/50-70/30 volume fraction) for different polymer concentrations at room temperature. The intrinsic viscosities were calculated by Solomon-Ciutta formula which is single point viscosity determination technique. Comparing the viscosity results, water/methanol (30/70) was the biggest viscosity value and the smallest value was the pure water.

Keywords: Polyvinylpyrrolidone, Viscosity, Solvent Effect

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ELECTROCARDIOGRAPHY TRAINING SET FOR BIOMEDICAL DEPARTMENT STUDENTS

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Abstract:

Electrocardiography (ECG) is a basic medical device that detects and displays electrical signals generated by the heart through the use of electrodes placed on the body. ECG, which is used in early diagnosis of many heart problems such as fast or slow heartbeat, could be designed in many sizes, either desktop or handheld. The ECG signals need to be separated from the noise signal and should be sufficiently amplified. The main electrical noise in the ECG systems is due to the grid current of 50 Hz. For this reason, in ECG design a band stop filter which stops the frequencies of only 50 Hz and passes all other frequencies should be utilized.

In this study, an affordable and updatable ECG training kit was designed to be used in the practical training of Biomedical Department students. The training set is a microcontroller based system that senses ECG signals and draws on a graphical display. The prepared system includes the steps of sensing, processing and displaying of ECG signals. This work is contemplated for use as an alternative training set in biomedical technology departments.

Keywords: Electrocardiography, Signal Processing, Training Set

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SEARCH FOR THE ANOMALOUS TOP QUARK COUPLINGS IN γp COLLISION AT THE LHC

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Abstract:

The top quark is the heaviest particle of the standard model(SM). Therefore, the top quark interactions and their production process provide a possibility for searching beyond the SM physics. Moreover, the effects of new physics on the top quark interactions are considered to be larger than particles, and conflicts with the SM expectations could be measured. In many experiments, ultraperipheral collisions and elastic interactions cannot be measured at the main detectors. Forward detectors are developed by the ATLAS and CMS collaborations to detect the scattering particles which cannot be detected by the main detectors. These extra detectors are located at distance of 220 m–420m from the central detectors. Usual pp deep inelastic scattering (DIS) incoming protons dissociate into partons. Therefore, DIS interactions have very high backgrounds. In the DIS interactions, made-up of jets from the proton remnants, many ambiguities are created which make it hard to measure the new physics signals. However, $\gamma\gamma$ or γp interactions have a clean environment compared to the usual proton-proton DIS, since in $\gamma\gamma$ or γp collisions with almost real photons, a photon is emitted, while the proton remains intact. We have examined the constraints on the anomalous $tq\gamma$ ($q = u, c$) couplings through the process $pp \rightarrow p\gamma p \rightarrow pWbX$ at the LHC by considering four forward detector acceptances: 0.0015 < ξ < 0.5, 0.0015 < ξ < 0.15, 0.015 < ξ < 0.15, and 0.1 < ξ < 0.5, where $\xi = E_\gamma/E$ with E_γ and E the energies of the photon and of the incoming proton, respectively. The sensitivity bounds on the anomalous couplings have been obtained at the 95% confidence level in a model independent interactions.

Keywords: Top quarks, LHC, Anomalous couplings.

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TRADITIONAL HERBAL TEAS CONSUMED IN MERSIN (TURKEY)

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Abstract:

Traditional herbal teas have been known since 5000 years and loved, created a tea culture with myths, idioms, arts and industry. The potential of flora and personal knowledge, especially in the region or country culture determine the preparation of a tea in the beginning. Our country has rich flora so cultivated or grown herbals is evaluated as tea traditionally. Herbal teas are made up of plant or plant mixtures that are consumed for most their pleasant aromatic flavors against to cold ailments, fatigue and insomnia. Usually, herbal teas obtained from root, stem, leaf and flower parts of plants and prepared for drinking by boiling in boiling water after being dried. In addition to the pleasurable properties of tea, various phenolic substances in their compositions have been shown to have antioxidant, antimicrobial and anticarcinogenic properties through various scientific studies. The study emphasized that the traditional herbal teas consumed often by the local people of the city of Mersin as traditionally. Present study, attributes a review article, the ethnobotanical studies had been done by Everest A et al., (2005); Esen B, (2008); Metin A (2009); Saday H, (2009); Sagiroglu M et al., (2013); Sargin SA, (2015) and Everest A et al., (2017) on traditional herbal teas in Mersin and its surroundings are considered. According to the results of this ethnobotanical study, 16 taxa were identified as traditional herbal teas in the study area belonging to 10 different families. The most encountered traditional herbal families consumed as tea were Lamiaceae (5 taxa), Asteraceae (3 taxa), Labiatae (1 taxon), Lauraceae (1 taxon), Oleaceae (1 taxon), Orchidaceae (1 taxon), Rosaceae (1 taxon), Scrophulariaceae (1 taxon), Tiliaceae (1 taxon) and Zingiberacea (1 taxon). The aerial portions of herba, leaves, roots and fruits were determined as the most favored parts about the traditional herbal teas. Traditonal herbal teas are consumed in a variety of ways. Ethnobotanically, Mersin is rich in flora due to its geographical situation. As a result, traditional herbal teas still consumed as traditionally in the city of Mersin (Turkey).

Keywords: Herbal teas, Mersin, Turkey

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RETROFITTING METHODS OF MASONRY BUILDINGS IN TURKEY

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Abstract:

Masonry buildings constitute about 50% of building stock in Turkey. These buildings are usually built by inhabitants that do not obey any design codes. These houses are usually enclosed by heavy roof masses, which cause the walls of the masonry building to be pushed with great force by the walls in the out-of-plane and in-plane direction. Hence, the building can be destroyed in a violent manner at the time of the earthquake. Masonry structures, which are heavily produced especially in rural areas, are damaged or destroyed even in moderate earthquakes, causing loss of life. Therefore, it is necessary to enhance the earthquake resistance of these structures by some retrofitting methods. One of these retrofitting methods is to use the fiber reinforced polymer (FRP) materials on the walls of the masonry buildings. The FRP materials are one of the most effective materials to retrofit of masonry walls to increase ductility and toughness capacities of masonry buildings.

Keywords: Masonry Buildings, earthquake resistance, retrofit, fiber reinforced polymer

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HIGH PERFORMANCE CONCRETE: AN OVERVIEW

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Abstract:

Today, high performance concretes (HPC) have become more and more important since permanent and durable structures are needed by the construction sector. Therefore, it is desired that concrete material has high ductility, high toughness, and high impact resistance as well as high compressive strength. Therefore, researchers have developed high performance concretes (HPC) that physical and mechanical properties are superior to conventional concretes. HPC has been commonly used in tunnels, concrete pavements, bridges, parking garages, and tall buildings for its outstanding strength, toughness, ductility, and durability properties. These superior properties can be achieved by special mixing techniques, the use of low water/cement ratio and high-quality ingredients. Pozzolanic admixtures such as silica fume and fly ash is added into concrete mix to increase strength and durability properties by reducing the permeability of the concretes. Another way to improve the ductility and toughness properties is to add steel and synthetic fibers in concrete mix.

Keywords: High performance concrete, ductility, toughness, impact resistance, compressive strength.

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INVESTIGATION OF PHYSICAL AND MECHANICAL CHARACTERISTICS OF PVA FIBER REINFORCED GEOPLYMER MORTARS PRODUCED WITH FLY ASH

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Abstract:

Due to the negative effects of the cement industry on the environment, various works have been carried out to produce alternative binder building material in recent years. It is possible to produce cement-like binder building material by activation with various alkalis, such as blast furnace slag, fly ash, and other industrial wastes. In this study, class F fly ash was activated with sodium hydroxide to produce geopolymer mortar samples. In the mixture, the binder / sand ratio is 1/3 and the water / binder ratio is 0.30. Polyvinyl alcohol (PVA) fiber reinforced geopolymer mortars were produced by mixing with NaOH (containing 14% sodium by weight), fly ash, sand and water. In the fibrous mortars, the PVA fiber ratio was determined as 0.5%, 1% and 1.5% by volume. Geopolymer specimens were placed in standard molds of 40 * 40 * 160 mm dimensions, then exposed to heat at 95 C for 24 hours. The samples taken from the temperature cure were kept at room temperature for up to 28 days. Then the physical and mechanical properties of the samples were examined. While the compressive strength of PVA-free geopolymer samples was determined to be 40.73 MPa, a compressive strength of 51.95 MPa was observed in geopolymer samples containing 1.5% PVA. It has been observed that the compressive strength increases with the increase of PVA fiber content.

Keywords: Fly ash, geoplymer, Polyvinyl alcohol, compressive strength

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HIGH TEMPERATURE RESISTANCE OF CEMENT BASED COMPOSITES PRODUCED BY USING EXPANDED VERMICULITE AND SILICA FUME

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Abstract:

Physical and mechanical properties of cement based composites, produced by using expanded vermiculite and silica fume, and subjected to high temperatures, were investigated in this study. Mixtures were prepared with expanded vermiculite to cement ratios of 4, 6, and 8 by volume. Cement was also replaced by silica fume at the percentages of 0%, 5%, 10% and 15%. Standard prism specimens with a dimensions of 40x40x160 mm3 were produced, demoulded after 1 day and kept in standard water curing until the age of 28 days. Specimens were exposed to 300°C, 600°C and 900°C temperatures after curing and tests were made on specimens cooled to room temperature in air. Reference (control) specimens which were not subjected to high temperatures were tested in laboratory ambitions temperature of 20°C. Some physical properties tests of unit weight, porosity, water absorption and ultrasonic pulse velocity were achieved on specimens. Residual flexural tensile and compressive strengths were also determined for mechanical properties. Experimental results of specimens subjected to high temperatures were compared with the reference ones.Mortars subjected to elevated temperatures show the similar behaviors, but different rates. Expanded vermiculite was more dominant on the resistance of mortars to elevated temperatures. As well-known, vermiculite is a fire proof material and due to this characteristic of vermiculite, when mortars produced with vermiculite subject to elevated temperature, vermiculite aggregates located at the outer surface act as barrier and prevent the cement paste from deleterious effect of elevated temperature. In other words, expanded vermiculite in mortar resulting in lesser decomposition of C-S-H phase. Finally, expanded vermiculite turns out to be a good fire resistant material so that it shows its contribution on residual strengths by keeping the initial strengths of cementitious materials up to the temperature of 900 °C.

Keywords: Expanded vermiculite, high temperature, residual strength

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TISSUE ENGINEERING IN RELATION WITH TEXTILES

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Abstract:

Textile technologies have recently attracted great attention as potential biofabrication tools for engineering tissue constructs. Using current textile technologies, fibrous structures can be designed and engineered to attain the required properties that are demanded by different tissue engineering applications.Tissue engineering is an important therapeutic strategy to be used in regenerative medicine in the present and in the future. Tissue engineering aims to improve the function of diseased damaged organs by creating biological substitutes. To fabricate a functional tissue, the engineered construct should mimic the physiological environment including its structural, topographical and mechanical properties. Functional biomaterials research is focused on the development and improvement of scaffolding, which can be used to repair or regenerate an organ/tissue. Scaffolds are one of the crucial factors for tissue engineering. Scaffolds consisting of natural polymers have recently been developed more quickly and have gained more popularity. For the fabrication into biomaterial scaffolds for tissue engineering, fibers are a continuous material structure that have an extremely high ratio of length to width, and particularly suitable since fibrous structures can morphologically resemble extracellular matrix components in tissues. Moreover, fibers can be collected and processed into complex fibrous networks using conventional textile techniques, such as knitting, weaving, or braiding to create 3D structures with improved structural and mechanical properties. Recently, there is growing interest in using nanofabrication techniques to fabricate nanometer-sized fibers for tissue engineering Fiber-based methods, which include direct writing and textile techniques, have emerged as promising technologies for creating 3D structures with tunable mechanical and biological properties. Fiber-based techniques allow a precise control over the positioning of fibers. These fibers can be used as carriers for drugs and microorganisms. The fibers can also serve as sacrificial structures to form vascular networks in cell-laden structures. In this study, a review of tissue engineering materials inrelation with textiles is presented in detail.

Keywords: Tissue Engineering, Textile Material, Biopolymer,Biomaterial

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USAGE OF PERLITE IN CERAMIC SANITARYWARE BODY COMPOSITION

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Abstract:

Perlite is the volcanic rock that includes %90-97 amorphous phase and %3-10 crystallized minerals. Perlite reserves are available all over the world. Turkey is the country with the largest reserves and is the country that cannot convert perlite into an add value product. Most of the perlite used in the construction and horticultural sector. Thanks to the high amorphous phase of perlite are candidate raw materials for ceramic materials. In this work usage of perlite in ceramic sanitaryware products examined. The work has been carried out together with the ceramic sanitaryware producer Kaleseramik which is one of the biggest ceramic producers in the World and revised in line with the needs of the company. All tests were prepared under industrial conditions. All samples fired in industrial tunnel kiln in Kaleseramik. Ceramic material composition development works done primarily. Several ratios of perlite used instead of albite raw material. Developed ceramic sanitaryware compositions examined based on the chemical analysis(XRF), rheological parameters of the prepared slips, dried and fired strength of the products, phase analysis(XRD). Specimens tested according to TS EN 997: 2012 standard. In order to examine the compatibility of ceramic sanitaryware body-glaze match, microstructures and thermal expansion coefficients of suitable compositions measured. Perlite addition increases the dry shrinkage, fired shrinkage and fired strength. All samples water absorption values under 0,02%. The major crystalline phases of the specimens are quartz and mullite. All samples have amorphous phase too. Perlite addition did not change the rheological parameters. Thermal expansion coefficient increased up to 10% of perlite addition. More perlite addition decreases the thermal expansion coefficient. It can be concluded that perlite can be used as ceramic raw material instead of albite in ceramic sanitaryware production.

Keywords: Perlite, Sanitaryware, Ceramic material

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THE EFFECT OF WALL TILE WASTES ON THE HIGH-TEMPERATURE DEFORMATION OF FIRECLAY SANITARYWARE PRODUCTS

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Abstract:

Ceramic waste material management one of the biggest problem of the ceramic producer all over the world. Using the waste products generated in ceramic manufacturing has been one of the important issues. Reusing the waste products is not only an environmental responsibility but also cost reduction issue. In this study, the possibility of using fired wall tile wastes(FWW) as a raw material for sanitaryware fire clay compositions was investigated. Industrial production fireclay composition selected as a standard fireclay recipe. Four sanitaryware fire clay compositions were prepared by adding FWW into the standard fireclay composition under industrial conditions at a ceramic sanitaryware producer in Turkey. Developed ceramic sanitaryware compositions examined based on the chemical analysis(XRF), rheological parameters of the prepared slips, technological parameters (dried and fired strength, water absorption, shrinkage) of the products and phase analysis(XRD). Specimens tested according to TS EN 997: 2012 standard. High-temperature deformation of the samples determined by using fleximeter. The results showed that addition of FWW increased the fired strength, decreased the water absorption of the fireclay products. High-temperature deformation decreased with the addition of FWW into the fireclay composition. Decreased deformation is a key factor for the sanitaryware designers. It can be concluded that FWW can be used in the fireclay production compositions as a raw material.

Keywords: Sanitaryware, waste management, wall tile waste

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THE IMPACT OF DESIGN ON HUMAN PSYCHOLOGY: CASE OF ANITKABIR

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Abstract:

Human scale is an important concept in design discipline which is the basis of many scientific fields today. It can be predicted that aesthetic, functional and non-economic designs that are not produced according to the human scale can not be sustainable. In addition to tihs, architectural design is also known to have an impact on human psychology. Although every cultural property in our world is produced for human beings, in the face of some constructions people lose the scale concept.

In this study, it aimed to measure the effect of design on human psychology. It was chosen Anitkabir as the study area to reach the aim. Anitkabir is the eternal resting place of Mustafa Kemal Ataturk, the founder of the Republic of Turkey. The project of Anitkabir was obtained with a competition. In this study, the design principles of the Anitkabir project including the entrance to the area, pedestrian and vehicular roads, square, lanes, roads, museums and exhibition halls, outdoor use areas, vegetal design and used materials were examined and the relationship with human psychology was explained. It has been observed that human psychology is influenced by colors, textures, shapes and the sizes such as height and width that structures have.

Keywords: Design, human, psychology, Anitkabir

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PREPARATION AND CHARACTERIZATION OF ANTIMICROBIAL FILMS FOR FOOD PACKAGING MATERIALS

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Abstract:

This study aimed to develop polyelectrolyte structured antimicrobial food packaging materials that do not contain any antimicrobial agents. Cationic starch was synthesized and characterized. Its nitrogen content was determined by Kjeldahl method. Polyelectrolyte structured antimicrobial food packaging materials were prepared using starch, cationic starch and sodium alginate and they were characterized. Antimicrobial activity of materials was defined by inhibition zone method (disc diffusion method). Chemical structure of samples was investigated by FT-IR spectroscopy and 1H NMR spectroscopy. Thermal stability of samples was evaluated by TGA and DSC. Hydrophobicity of samples was determined by contact angle measurements. Optical transparency of samples was characterized by UV-visible spectroscopy. Surface morphology of samples was investigated by SEM. Moreover, gel contents of samples were determined. The obtained results prove that produced food packaging materials have good thermal, antimicrobial, surface and optical properties, and they can be used as food packaging material in many industries.

Keywords: Antimicrobial food packaging, Polyelectrolyte, Starch, Cationic starch, Sodium alginate.

This study is supported Bulent Ecevit University Scientific Research Commission

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DEVELOPMENT OF PSYCHOLOGY IN TURKEY DURING INONU ERA (1938-1950)

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Abstract:

This paper aims to analyze and enlighten development of psychology in Turkey during Inonu Era which played vital role in history of psychology in Turkey especially about foundation and scientific developments of psychology in modern Turkey. The first step of development in the field of psychology was taken at Istanbul University by establishment of experimental psychology chair in 1937 and psychology started to gain a scientific identity In Inonu Era, preliminary studies were prepared for the establishment of an independent experimental psychology institute from Istanbul University, a pedagogical institute and the establishment of the psychology laboratory and psychology library which were affiliated to this institute completed. The preparation of undergraduate theses by experimental method, the practice of psychology, and the arrangement of researches in the field of psychology were accomplished by the students under the leadership of Ord. Professor Dr. Wilhelm Peters who was one of the founders of the scientific work of psychology in Turkey. He had sincerely expressed the efforts of these early years and the short-lived astonishing achievements in the first journal of Psychology and Pedagogy Studies (1940). Professor Mumtaz Turhan who was a close friend of Professor Peters played a major role in establishing psychology in Turkey as a well-established science at Istanbul University. Research in psychology in Istanbul and developments in this field were started to be published in the Journal of Psychology Studies since the years when the Institute and the Chair were established and these publications are still going on.

Keywords: Psychology in Turkey, History of Psychology, Development of Psychology, Inonu Era.

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SYNTHESIS AND CHARACTERIZATION OF AU NANOPARTICLE BY LASER ABLATION TECHNIQUE

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Abstract:

Gold nanoparticles (Au-NPs) are the focus of research and applications especially in nanomedicine, because of excellent biocompatibility, chemical stability, and encouraging optical properties. The aim of the study is to assess the safety, uptake, and biological behavior of laser-synthesized Au-NPs prepared in water or polymer solutions in human cell lines. For this purposes, we prepared the Au-NPs by pulsed laser ablation technique in liquid medium. Au target (99.99%,) was placed at the bottom of the glass vessel filled with deionized water (18.2 MΩcm) or with 1 mg/mL PEG or with 1 mg/mL dextran. The laser ablation process was carried out by OKYAYTECH Laser Nanoparticle Synthesis System that utilizes a fiber laser (NUQA, 1064 nm wavelength, 30 Hz repetition rate, 100 ns pulse duration). The laser beam is scanned spirally over the target surface for ~15 min that yielded a orange solution. The laser fluence is chosen to be 6mJ/pulse and scan speed is fixed at 2000 mm/s. Then the target is removed and ablation is applied on solution for 3 hours to obtain deep red color. The concentration of the NPs was determined by the weight loss of the target after the ablation. In order to obtain the sample of Au-NPs in pure deionized water (Au-NPw) with narrow size distribution, the NPs produced by laser ablation underwent the laser fragmentation step. The solution was stirred with a magnetic stirrer during the whole fragmentation process. High-resolution transmission electron microscopy (TEM), the optical absorption spectrum of the NPs by UV/Vis/NIR spectrometer and photoluminescence spectrum using a spectrofluorometerwere performed for characterization of the NPs.

Keywords: Au Nanoparticle, biocompatibility, optical properties

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SYNTHESIS AND CHEMOSENSOR PROPERTIES OF THIAZOLIDINE MOLECULE CONTAINING NAPHTHALIMIDE RING

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Abstract:

Fluorescent molecules are quite important and have been extensively studied due to usability in optoelectronic area. In the same manner, there are a lot of publishes about optical and organic electronics applications of naphthalimide derivatives, and this structure can appear as a different subclass of fluorescent dyes. Naphthalimide derivatives can be shifted to longer wavelengths by extending the π-conjugation system via structure modification. In addition, the photophysical properties can be changed by modifications on the naphthalimide molecule. Fluorescence based pH probes have become promising tools due to their high sensitivity, selectivity, and low cost.
Thiazolidine molecule containing naphthalimide ring was synthesized by a few steps synthetic and characterized by spectroscopic methods. Then its photophysical properties, pH sensing behaviours and pH-dependent hydrolysis were systematically investigated by UV and fluorescence spectroscopy.

Keywords: Fluorescence, Naphthalimide, pH Sensing, Sensor

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APPLICATIONS OF SUPERHEATED STEAM DRYING IN FOODS

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Abstract:

Drying, independent from the method and equipment being used, has been one of the most important and widely used methods of food preservation. Drying on one hand helps limiting chemical, enzymatic and microbial reactions due to lowered water activity and causes undesired changes in nutritional, sensoral and textural properties of food on the other. Therefore main goal of any given drying method is to design and optimize drying technique, processing parameters and equipment to reach targeted properties of dried food. Steam at temperature higher than its boiling point at constant pressure is simply defined by superheated steam. Superheated steam drying involves in replacing hot air with superheated steam in convective drying. During drying heat transfer is provided by superheated steam that supplies addition of sensible heat onto food material for temperature increase and latent heat of superheated steam condensation is used as the latent heat needed for water evaporation from food surface while mass transfer is mainly by water evaporation from the food surface. Evaporated water stays in drying medium until pre-set critical pressure is reached than exhausted to adjust system pressure. Drying occurs in three consecutive phases namely initial condensation-evaporation, constant rate period and falling rate period. Superheated steam drying has some advantages over hot air drying such as energy efficiency due to high heat transfer coefficient, increased drying rates, oxidation prevention due to steam drying medium instead of air, simultaneous thermal preservation (blanching, pasteurization, sterilization) and deodorization of foods being dried while main drawback is limited use in termo sensitive foods due to undesirable changes in food components by high temperature. The aim of the present work is to summarize superheated steam drying technique, equipments, system configuration, heat and mass transfer and applications in food processing under the light of recent publications.

Keywords: Superheated Steam, Drying, Heat And Mass Transfer, Food

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THE INVESTIGATION AND COMPARISON OF FRICTION STIR SPOT WELDING AND ELECTRICAL RESISTANCE SPOT WELDING OF AA2024 ALUMINUM ALLOY JOINTS

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Abstract:

Both Friction Stir Spot Welding (FSSW) and Electrical Resistance Spot Welding (ERSW) are contemporary techniques for joint of the thin sheet materials. But FSSW is more modern technique than ERSW. FSSW is used a lot of area which are from marine to aerospace industries. Aluminium alloy has a lot of advantages of the other materials. One of them is weight. In this study, AA2024 sheets are chosen for FSSW and ERSW joint. FSSW is effected with tool rotational speed, tool transverse speed, dwell time and tool plungle depth. Two sheets were joined under the tool rotational speed for 1040 rpm and dwell time for 10 second. The same samples joints with under ERSW for 39 kA and dwell time for 0.5 second. These parameters are optimised for both welding techniques. Afterwards FSSW and ERSW are compared about lap shear tensile test for aluminum alloy joints with plane thickness of 1.6 mm. So that FSSW is more suitable joning process than ERSW. As a results of test and analyses are showed that FSSW is better mechanical properties than ERSW. Eventually, These results are verified by many experiments.

Keywords: Friction Stir Spot Welding, Electrical Resistance Spot Welding, Aluminium alloys, Mechanical properties, Welding parameters

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BER PERFORMANCE OF PRECODED OSTBC MIMO SYSTEM WITH AND WITHOUT ANTENNA SELECTION IN RAYLEIGH FADING CHANNELS

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Abstract:

In this paper, Precoded - Orthogonal Space Time Block Coding (OSTBC) in Multiple-Input Multiple-Output (MIMO) systems have been presented. Precoding transmission scheme that exploit channel state information (CSI) on the transmitter side of a MIMO system exploits channel information for increasing channel capacity, and bit error rate (BER) performance with the absence of reducing hardware complexity. Whether it is impossible to have full CSI because of feedback delay at transmitter side of the communication system in practice, by using precoding technique with multiplying space-time codeword by a precoding matrix which is chosen from the codebook, and choosing an efficient codeword in order to improve the overall system performance. This situation is theoretically possible. Besides, precoding technique, another efficient way to improve BER performance and capacity gain of the total system, is antenna selection technique. By using antenna selection, a small number of RF chains, than the number of MIMO transmit antennas, are employed. Therefore the cost related with the multiple RF modules is reduced. Also, more diversity gain and better BER performance has been achieved without any addition RF module at the transmitter. Simulation results have demonstrated that the behavior of precoded OSTBC outperforms the STBC without increasing any transmit power or any additional bandwidth requirement. Performing antenna selection for the STBC scheme achieves more gain in terms of BER performance over the precoding method in Rayleigh fading channels.

Keywords: OSTBC, BER, Rayleigh Fading Channel, MIMO, CSIT, Precoding

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A REVIEW ON LOW VOLTAGE ANALOG CIRCUIT DESIGN

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Abstract:

Tendency in low voltage and low power analog integrated circuits has increased on several years, as system power restrictions and nanotechnologies require lower supply voltages. At the present time, a new trend towards extremely low voltage and circuits is emerging. Using lower voltage supply and decreased power consumption of integrated circuits is critical factor since it provides the device reliability, avoids overheating of the circuits and especially extends the operation time for battery powered devices. The demand for lower power dissipation in circuits such as wireless, mobile and wearable devices has motivated the value of supply voltage down to 1 V. MOSFETs (metal oxide semiconductor field effect transistors) have been considered for low voltage low power analog circuit design because their operating voltage can be made less than that of BJTs (bipolar junction transistor) known as their counterparts. In this paper, the advantages and disadvantages of each of these techniques such as bulk-driven (BD), floating-gate (FG), quasi-floating-gate (QFG), threshold voltage of the MOS transistors (MOST) and dynamic threshold MOS transistors (DTMOS) techniques have been elaborated. Consequently, the most crucial task for analog circuits is to maintain the performance of the circuit by designing new circuit structures ability to operate with low supply voltage.

Keywords: Low Voltage, Analog Circuit Design, Integrated Circuits

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CURRENT MODE VERSUS VOLTAGE MODE FOR ACTIVE CIRCUIT BLOCKS

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Abstract:

It is stated in the study that there would be essential difference between current mode and voltage mode circuits. Because of voltage mode and current mode circuits are often built with different design techniques, there are actually performance differences between voltage mode and current mode circuits. Although voltage-mode circuits utilize higher loop gains and lower distortion than current mode circuits, current mode circuits have circuit simplicity, lower power consumption and their speed has been achieved at the same conditions they are compared to. Active circuit blocks such as operational amplifier (OPAMP), current conveyor (CC), four terminal floating nullor (FTFN) and operational transconductance amplifier (OTA) have been often employed in analog integrated circuits. Recently, current mode operation has become trend for analog integrated circuit design. In this study, current mode circuits and voltage mode circuits based active blocks have been investigated. It has been clearly shown that current mode circuits have more advantages.

Keywords: Current Mode, Low Voltage, Analog Circuit Design, Active Blocks

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SOLID-CONTACT CR (VI)-SELECTIVE COPPER ELECTRODE BASED ON A CALIX[4]ARENE DERIVATIVE

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Abstract:

In aqueous systems, chromium is present in different species such as Cr (III) and Cr (VI). But Cr (VI) species are poisonous because of their oxidizing [1]. Many techniques such as spectrophotometry, differential pulse polarography, spectrofluorimetry, gas chromatography, ion chromatography with atomic absorption spectrometry, potentiometry, differential pulse voltammetry are used to identify these chromium species. However, the reason for the use of potentiometry by ion selective electrodes is an easy construction technique, low cost and rapid method [2-4]. For this aim, solid-contact Cr(VI)-selective copper electrode was prepared by using macrocyclic compound of 5,11,17,23-tetra(tert-butyl)-25,26,27,28-tetra(4-propylimidazole acetamide)-calix[4]arene as an ionophore. The type and ratio of membrane components used in the construction were optimized, and also, the effect of working conditions such as pH and conditioning solutions on the performance of this electrode was investigated. The slope, limit of detection, lifetime, response time, linear working range and selectivity coefficients of this electrode was determined. Additionally, the effect of MWCNTs on the response characteristics of the electrode was evaluated. Two different techniques, SEM and EIS were studied to observe whether the membrane components were homogeneously distributed and to make interpretations related to the changes in the membrane resistances as a result of interaction between calix[4]arene derivative-Cr (VI) species. All emf measurements were performed by using multichannelled pH-ion meter and the electrochemical cell below: D. J. Reference Electrode || Analyte Solution | PVC Membrane | Cu wire The electrode prepared with optimum membrane composition (2% ionophore, 29.7% PVC, 68.3% o-NPOE and 1.5 mg MWCNT) exhibited a near-Nernstian slope of 49.4±4.5 mV per decade for Cr(VI) ion in the range of 1.0×10-1-1.0×10-5 M at pH 5.0. Analytical applicability of these electrodes prepared with optimum membrane components was shown in two ways: (i) titration of the standard lead nitrate solution with Na2CrO4, (ii) determination of lead in a reference material containing lead.

Keywords: Ion-Selective Electrode, Calix[4]Arene, Potentiometry, Cr(VI) Determination

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ENERGY AND EXERGY ANALYSIS OF WATER-STEAM SEPARATORS USED FOR SEPARATING DOUBLE-PHASE GEOTHERMAL FLUIDS IN A GEOTHERMAL FIELD

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Abstract:

Geothermal energy can be used for electricity generation, heating and industrial applications. The geothermal fluid can be obtained in the form of saturated/compressed liquid, liquid-vapor mixture, saturated vapor /superheated steam from a geothermal well. Among them, liquid-weighted systems are much more common. Based on the operation pressure of the well, the fluid can be removed in the form of desired liquid water or a liquid-vapor mixture. Thus, it is important to locate and design the wellhead system within the steam and fluid entrainment systems. The wellhead facilities mainly consist of well valves and pipelines, separators, safety valves, main steam transmission line and control system. The geothermal fluid obtained from a geothermal well is transferred to the turbine-generator group completely in the vapor phase by using wellhead equipment to generate electricity. Dry steam, which is free of undesirable matters and moisture, is provided by the separators. Therefore, efficiency of the water-steam separators is important in order to separate the two-phase geothermal fluids and to obtain dry basis steam. The separators should be properly designed, and the energy losses in the separators should be reduced in order to provide high-efficiency geothermal energy systems. In the design and analysis of energy systems, the use of exergy analysis plays an important role to determine the thermodynamic efficiencies and the losses occurring in the system. In this work, the energy and exergy efficiencies of water-steam separators of a geothermal power plant were investigated based on the obtained data from six production wells in a geothermal field. The thermodynamic losses were determined, and the performances of the separators were evaluated.

Keywords: Geothermal Energy Fields, Separators, Wellhead Systems, Energy, Exergy

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DEHYDROGENATION OF N-HEXANE IN A CHEMICAL HEAT PUMP SYSTEM

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Abstract:

The growing need for energy as a result of industrialization and growing population has brought out the need for finding alternative energy sources. Thus, utilizing low grade energy sources such as process waste heat and renewable-energy sources is becoming increasingly important for designing sustainable energy systems. In particular, the use of waste heat generated in industrial processes presents an alternative way for efficient use of energy. A chemical heat pump system draws attention as a technology that enables low temperature heat energy to be obtained at a high temperature from a reversible catalytic chemical reaction. In this study, n-hexane / 1-hexene / hydrogen chemical heat pump system was investigated. The simulation of the process was carried out by using a simulation software. The Soave Redlich Kwong (SRK) equation of state was used for the simulation. Based on the steady state conditions, mass and energy balances were obtained for each unit of the system and for the overall process. As a result, it has been demonstrated that the n-hexane / 1-hexene / hydrogen chemical heat pump system can be used for evaluating the low grade energy sources, especially for utilizing process waste heats.

Keywords: Energy, Waste Heat Recovery, Chemical Heat Pump, Simulation

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A BI-OBJECTIVE MODEL FOR INTERMODAL TRANSPORTATION OF HAZARDOUS MATERIALS

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Abstract

Hazardous materials (Hazmat), which can cause damage to the living creatures and the environment due to their chemical or physical characteristics, have been used in many sectors in recent years so the importance of transportation of hazardous materials is on the rise. Despite the fact that railway transportation is superior in terms of risk and cost, the highway is widely used for transportation of hazardous materials. In this study, which focuses on the transportation of fuel constitutes a significant part of the transportation of hazardous materials, we propose a bi-objective transportation model for routing rail-truck intermodal shipments. The model aims at minimizing the total transportation cost and total transportation risk between supply and demand points.

Keywords: Bi-Objective Optimization, Hazmat, Intermodal Transportation.

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SYNTHESIS AND CHARACTERIZATION OF AU NANOPARTICLE BY LASER ABLATION TECHNIQUE

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Abstract

Gold nanoparticles (Au-NPs) are the focus of research and applications especially in nanomedicine, because of excellent biocompatibility, chemical stability, and encouraging optical properties. The aim of the study is to assess the safety, uptake, and biological behavior of laser-synthesized Au-NPs prepared in water or polymer solutions in human cell lines. For this purposes, we prepared the Au-NPs by pulsed laser ablation technique in liquid medium. Au target (99.99%,) was placed at the bottom of the glass vessel filled with deionized water (18.2 MΩcm) or with 1 mg/mL PEG or with 1 mg/mL dextran. The laser ablation process was carried out by OKYAYTECH Laser Nanoparticle Synthesis System that utilizes a fiber laser (NUQA, 1064 nm wavelength, 30 Hz repetition rate, 100 ns pulse duration). The laser beam is scanned spirally over the target surface for ~15 min that yielded a orange solution. The laser fluence is chosen to be 6 mJ/pulse and scan speed is fixed at 2000 mm/s. Then the target is removed and ablation is applied on solution for 3 hours to obtain deep red color. The concentration of the NPs was determined by the weight loss of the target after the ablation. In order to obtain the sample of Au-NPs in pure deionized water (Au-NPw) with narrow size distribution, the NPs produced by laser ablation underwent the laser fragmentation step. The solution was stirred with a magnetic stirrer during the whole fragmentation process. High-resolution transmission electron microscopy (TEM), the optical absorption spectrum of the NPs by UV/Vis/NIR spectrometer and photoluminescence spectrum using a spectrofluorometer were performed for characterization of the NPs.

Keywords: Au Nanoparticle, biocompatibility, optical properties

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