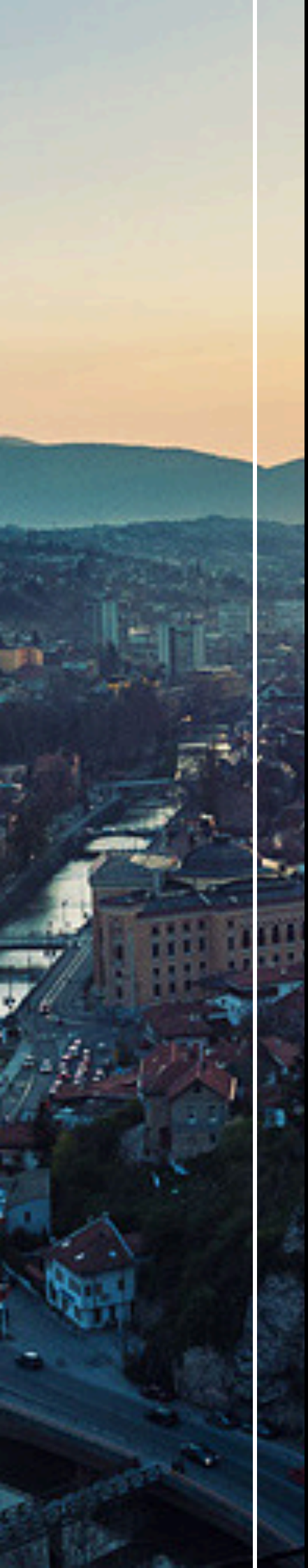

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INTERNATIONAL CONFERENCE ON ENGINEERING TECHNOLOGY AND INNOVATION

BOOK OF ABSTRACTS

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Best regards,

Prof. Dr.Özer ÇINAR

CONTENT

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DECISION SUPPORT SOFTWARE IN RATE OF INNOVATION ADOPTION: INOAPP

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Abstract:

Usage of ERP software increases in line with technological developments, it is seen that innovation and rate of adoption concepts started to be settling inside the enterprise cultures. Hence, companies feel obligated to manage innovation and practice adoption of innovation. The aim of this study is to develop a decision support software (DSS) that indicates what kind of actions need to be taken by companies to obtain the maximum efficiency from e-business software users whom are working in different type of department or companies. DSS, which is called InoApp, has been developed in RAD Studio 10.1 platform with Delphi programming language. To obtain data and decision rules for InoApp, five innovation characteristics', which Rogers argue that they affect the rate of adoption for innovation, effects on 403 ERP software users have been analyzed categorically by using Self Organizing Maps (SOM) technique. InoApp, contains 10 sections such as software type, gender, age, education, major, total/current work experience, sector, department, and frequency of usage. Combination of sub-sections creates 1536 user types for companies. InoApp provides what types of actions need to be taken by companies and suggestions for companies for each type of user under five innovation characteristics. Implementation of InoApp, is conducted with E-business application users in four departments of a Furniture Company in Turkey. After 33 users from the departments of Foreign Trade, Accounting, Purchasing and Production used the InoApp, suggestions have been collected from the software and comparisons by departments and company have been made and actions which are needed to be taken are designated. According to the results, training and support service for E-business application which company is using need to be provided and some of the users from departments need to be rotated. By this way, effectiveness of an employee and business will be affected positively.

Keywords: Decision Support Software (DSS), Inoapp, Innovation Characteristics, Rogers, E-Business

THE FLAME RETARDANT EFFECT OF TRI BUTYL PHOSPHATE (TBP) CHEMICAL ON THE LEATHER

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Abstract:

Nowadays, some applications in leather manufacture have not be still made why the leather is an organic material and more different material than textile. Flame retardant leather is one of these applications. When catching fire, leather can burn easily and release a lot of toxic gases and smoke because the leather products could contain some inflammable and harmful organic compounds after tanning, fat liquoring, dyeing and finishing processes. However the production of flame retardant leather is so important for some leather types as cyclist jackets, flr or automotive upholstery leathers. If these type leathers ignite lately, the will provide gaining time in order to rescue humans during the fire. For this reason, in this research was aimed to product flame retardant leather and the flame retardant effect of leathers treated with tributyl phosphate (TBP) were investigated. Tri butyl phosphate (TBP) chemical solutions were applied to the leathers at %0, %7, %14 and %21 different rates by padding finishing technique and after the flame retardant application, the leathers were finished with traditional finishing recipe. Flame retardant property of leathers were researched by vertical (TS ISO 6941:2007) and horizontal (TS ISO 3795: 1999) fire resistance tests The thermal stability and morphology of the flame retardant leathers were characterized by TG+DTG and SEM. The results showed that TBP treated leathers has good flame retardant properties and can enhance effectively the fire retardancy of leathers.

Keywords: Leather, Tri Butyl Phospate, Flame Retardant, Fire

ELECTROMAGNETIC HIGH FREQUENCY TRANSIENTS MEASUREMENTS OF SOME HOUSHOLD DEVICES

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Abstract:

Electric and electronic devices are contributing to our exposure to wide range of electromagnetic frequencies, therefore causing an increase of electromagnetic pollution in both rural and urban environments. This exposure to spiking and frequencies of electromagnetic radiation on overburdened wires has been known as “dirty electricity”. Furthermore, it is more specifically the “transients” and “harmonics”, which are tiny spikes in the electricity turning house wiring into an antenna, radiating the formed spikes’ frequencies. This arising dirtiness has the potential to cause and exacerbate health problems existing in some people. Some experts consider dirty electricity to be the most biologically active electromagnetic pollution. Although the exact magnitude of effects of EMF on population health cannot be assessed, largely due to misclassification and bias in the assessment of, most studies suggest that risks, if present, are likely to be moderate. Given that most people nowadays are routinely exposed to EMF, this would however imply that potentially large numbers of people could suffer from adverse health effects or diminished well being related to EMF exposure. Large research study, such as for example the INTERPHONE , have been initiated to address public concern regarding effects of EMF. Some of the incidence of headaches, general weakness, dry eye or mouth, facial flushing, depression, mood, dizziness, pain, incidence of asthmatic symptoms and other respiratory symptoms, skin irritation, clarity of thought and more energy. Some students with attention deficit disorder (ADD) or attention deficit hyperactivity (ADHD) might be more sensitive to EMF energy.

In this study, we would like to emphasize dirty electricity has some harmful effects on human body. For this purpose, electromagnetic spectrum analysis and electric and magnetic field measurements of some household devices like hair dryer, old ray tube television, blender, electrical heater, toaster, vacuum cleaner and microwave oven are measured and discussed.

Keywords: Electromagnetic Household Devices, High Frequency Transient, Measurement

EFFECT OF CO ADDITION ON THE ELECTRICAL PROPERTIES OF NI-MN-O NTC THERMISTORS

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Abstract:

Temperature sensors such as thermocouples, resistance temperature detectors, NTC thermistors are widely used for monitoring of temperature. NTC thermistors have various advantages such as fast response time, low cost, small size, large changes in resistance versus temperature.

Nickel manganite based NTC thermistors are derived from two or more metal oxide powders such as manganese oxide, iron oxide, cobalt oxide, nickel oxide, copper oxide, and zinc oxide. In commercial spinel-based NTC thermistors, the material constant “B” is between 2000 and 5000 K and sensitivity coefficient at 25oC is in the range between -2.2 and -5.5 %/K.

In this study, the influence of Co addition on the electrical properties of Ni0.5CoxMn2.5-xO4 (x=0.5, 0.8 and 1.1) NTC thermistors was investigated. The samples manufactured by the conventional solid-state reaction method. The powders were calcined at 900oC for 2 hours and were pressed to form disc shaped samples. The samples were sintered at 1300oC for 5 hours in air. The bulk density of the sintered samples was calculated using Archimedes principle. The microstructure of samples was observed using a scanning electron microscope. The sintered samples were coated with silver paste to form electrodes. The electrical resistance was measured in a temperature programmable furnace, logged every 0.1oC, between 25 and 85oC.

The electrical resistivity at room temperature and B value of Ni0.5Co0.5Mn2O4 sample were 1127 Ω.cm and 3735 K. These values were decreased to 1042 Ω.cm and 3648 K when the Co content was increased to 0.8. The electrical resistivity and B value further decreased to 548 Ω.cm and 3510 K when Co content was 1.1. Similarly, activation energy and sensitivity coefficient of samples were decreased with the increasing Co content. As a result, the addition of Co can be used as a dopant to improve the electrical conductivity of NTC thermistors.

Keywords: Cobalt Oxide, Electrical Properties, NTC Thermistors

DESIGN OF A SOLAR - HIGH TEMPERATURE PEM FUEL CELL HYBRID SYSTEM FOR MICRO COMBINED HEAT AND POWER APPLICATION FOR RENEWABLE ENERGY COMMUNITIES

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Abstract:

Hybrid system has a combination of mainly different renewable energy sources available and stabilizes the system which ensures the stable output from sources and reduces the bonage on climate changes. Hybrid power generation system with PV panels is a fast growing technology and it is expected that it will play a major role in the future global electricity generation with hydrogen energy. The aim of this study is to provide a theoretical design and analysis for a renewable energy community electricity and heat demand in Ankara (Turkey). In the present study, a high temperature proton exchange membrane fuel cell stack design and analyze for micro-CHP with using photovoltaic (PV) panels and electrolyzer. Integration of PV panel system powers the electrolyzer in order to generate enough hydrogen and oxygen from water to meet energy demand of the communities. This design is environmental, efficient, and independent of coal and oil. Thus, World energy demand is raising quickly with the increasing population and industrialization in the future fossil fuels like coal, natural gas and oil do not meet our energy demand. Renewable energy sources have importance for these reasons. Alternative energy sources are mostly used in hybrid systems in order to increase system overall efficiency. The study shows that this hybrid power micro combined heat and power system provides a viable option for powering stand-alone energy communities in a self-sustained manner.

Keywords: Solar Energy, Hydrogen Energy, Hybrid System, Renewable Energy Communities

PRINCIPLES, OBJECTIVES AND TECHNICAL DIFFICULTIES IN SMART GRID CONTROL

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Abstract:

Smart grid will along with facilitate novice sources of energy and new forms of requirements. The potential of smart grids are huge. They could revolutionize the way we produce and use energy, enabling new forms of generation to connect and bringing customers into the heart of the equation with their ability to shift demand and balance the system. Smart grid can help us keep the power on at minimum cost to consumers, while creating jobs and improving growth. Participation is informed and enabled new products, service, and markets, accommodating all generation and storage options and provided the power quality for the range of needs in the 21st century economy by smart grid. Power consumption differs based on time; season of the year, the day of the week, and the hour of the day, weather; temperature, humidity, wind, sky coverage and type of consumers; residential, commercial or industrial. Optimizing the power generation according to demand acquisition utilization and operating efficiency. The study shows that smart grid inspects the power control for both consumer side and producer side. Therefore, optimizing the power management which has been demonstrated with the proposed method optimizes the cost savings. The proposed smart grid optimization methodology provides an applicable option for developing the perfect balance among reliability, availability, efficiency and cost.

Keywords: Smart Grid, Optimization Methods, Power Management

AN EFFICIENT MECHANICAL DESIGN OPTIMIZATION FRAMEWORK BASED ON ANN-SURROGATE MODEL AND PARTICLE SWARM OPTIMIZATION

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Abstract:

The optimization of the designs including simulated data or experimental data is still challenging since most of the design problems involves dealing with the characteristics of non-linearity and non-differentiate. To that end, there is a need to easily and efficiently utilize the integration of surrogate models and simulation-based optimization methods. In this work, a framework to optimize these kind of design problems by using ANN-based surrogate model and PSO algorithm is proposed. A case study is considered to show the applicability and efficacy of the proposed optimization framework, and it is observed that this framework can handle the design problems having non-linearity and non-differentiate functional characteristic through the integration of ANN and PSO.

Keywords: ANN, Mechanical Design Optimization, Particle Swarm Optimization, Surrogate Model..

INFLUENCE OF ELECTRON CONCENTRATION ON THE MARTENSITIC TRANSFORMATION AND STRUCTURAL PROPERTIES OF CU-AL-FE HIGH-TEMPERATURE SHAPE MEMORY ALLOYS

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Abstract:

Nowadays, shape memory alloys with high operating temperatures suitable for use in space and aerospace industries are needed. Especially because of their low cost, CuAl-based alloy systems are of great interest as high-temperature shape memory alloys among different shape memory alloy groups. In this work, martensitic transformation and structural properties of high-temperature Cu-Al-Fe shape memory alloy systems with different electron concentrations (e/a ratio) were studied by means of differantial scanning calorimeter (DSC), X-ray diffractometer (XRD) and scanning electron microscope (SEM) measurements. DSC analysis showed that all alloy samples exhibited high-temperature shape memory characteristics and that the martensitic transformation properties of the alloys changed depending on the e/a ratios. From the thermal analysis results, it was found that the operating temperatures of the alloy samples decreased with increasing e/a ratios: the values of martensite start (Ms) and thermodynamic equilibrium (T0) temperatures of the alloy samples decreased from 261 oC to 195.6 oC and from 310 oC to 279.85 oC, respectively. Structural and morphological analysis revealed that the main martensitic phase in the alloy samples was 18R martensite and microstructures of the alloy samples contained different precipitate phases. It was also found that phase components of the alloys were not affected by the increased e/a ratio.

Acknowledgement: This work was supported by Management Unit of Scientific Research projects of Firat University (FUBAP) (Project Number: FF.15.16)

Keywords: Cu-Al-Fe; Electron Concentration; Martensitic Transformation

FUTURE BASED ON ADDITIVE MANUFACTURING TECHNOLOGIES: 3D PRINTING

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Abstract:

The availability of the product is vital as the consumer needs increase. Difficulties in production and supply chain cause manufacturers to quickly adopt new technologies. Nowadays, 3D printing (3D-P), one of the new technologies that mentioned as an additive manufacturing (AM), is a solution to many production problems. AM is building 3D objects by adding layer-upon-layer of material, whether the material is plastic, metal or concrete. The 3D-P, which have been chosen because of the fact that they can only make rapid prototypes, and because they speed up the design process very much, have come to the level of being used for the final product production with the development of the technology used. Today, 3D AM technology is used for modeling, prototype manufacturing, tool manufacturing, limited production parts, and specific parts manufacturing applications. More recently, 3D AM is being used to fabricate end-use products in aircraft, electronic circuits, dental restorations, education, space researches, medical implants, aircraft engines, automobiles, and even fashion products. The main advantages of 3D AM technology are the freedom to design, the production of complex designs at much cheaper cost, the inadequacy of team needs, the possibility of lighter designs, and the elimination of a few of the production steps in one go. The most positive aspect of this technology is that the products that are simple structures with three-dimensional printers can be produced by everyone, that is, they are the same as those that produce and consume. Innovations that 3D AM will bring; much faster product development and commissioning processes; production strategies and methods to be prepared from scratch; change in profit and raw material sources; brand new abilities; new competitors. This research compiles the development process, usage areas and innovations of 3D AM technology.

Keywords: Additive Manufacturing, 3D Printing,

POSITION DEPENDENT MASS EFFECTS ON HYDROGEN ATOM IN DEBYE PLASMA

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Abstract:

In order to investigate the plasma screening and position dependent mass effects on the hydrogen atom in Debye plasma, the effective SchrOdinger equation including more general exponential screened Coulomb potential is approximately solved analytically. The effects of the screening parameters on energies are investigated approximately by solving the effective SchrOdinger equation using asymptotic iteration method.

Keywords: Hyrdogen Atom, Energy, Debye Plasma, Position Dependent Mass

EFFECTS ON FORAGE QUALITY OF SWEET SORGHUM SILAGE WITH ADDITION OF MUNG BEAN (VIGNA RADIATA)

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Abstract:

Sweet sorghum is known to be an annual C4 plant of tropical origin and is an interesting crop. It is well adapted to sub-tropical and temperate regions, being highly biomass productive and water efficient. Sweet sorghum which can be grown under widely differing climatic conditions, has been identified as a promising crop with the potential to provide for a wide spectrum of forage or energy uses. Sweet sorghum is ensiled to preserve its nutritive value and it has high metabolic energy value, but crude protein is low. Many studies have been conducted to assess the benefits to dry matter yield and nutritive value of combining sorghums with annual legumes. This study was conducted to evaluate nutritive value of sweet sorghum (Sorghum saccharatum) silage when ensiled with different proportions of mung bean (Vigna radiata). Sweet sorghum was harvested at the late dough stages of kernel maturity and mung bean was harvested at a vegetative stage in two consecutive years (2013-2014) at Ege University, Faculty of Agriculture, Department of Field Crops, Izmir, Turkey. Crops were chopped using a conventional chopper. Sweet sorghum was mixed with mung bean at ratios of 100:0, 75:25, 50:50, 25:75, and 0:100%, respectively. For each mixture, 1 kg of fresh material was vacuum sealed in a plastic bag and fermented for 60 days, four bags per mixture. Crude protein (CP) increased as proportion of mung bean increased in the mixture. In addition, pH, lactic and acetic acids increased when mung bean was added. Silage with 100% mung bean had the highest pH and lowest lactic acid concentration. It is concluded that mixing mung bean with sweet sorghum for silage increased CP concentration of the mixture. Additional research is needed to assess mixtures that produce silage with more desirable fermentation characteristics.

Keywords: Sweet Sorghum, Mung Bean, Silage Quality, Crude Protein Content

FORAGE YIELD AND SOME QUALITY CHARACTERISTICS OF SWEET SORGHUM (SORGHUM BICOLOR VAR. SACCHARATUM) AS AFFECTED BY PLANT DENSITIES UNDER MEDITERRANEAN CLIMATIC CONDITIONS

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Abstract:

Plant density is one of the important factor determines growth, development and yield. Plant density selection to allow for expression of maximum forage yield is a management practice that would make sorghum production more economical. Cultivation of plants with desirable density has positive effect on crop yield components, so that the suitable will be achieved by optimum plant density. This study was conducted to evaluate the effects of plant density on forage yield and some quality characteristics of sweet sorghum (Sorghum bicolor var. saccharatum) grown in summer second crop production period, on the experimental fields of Faculty of Agriculture, Ege University under Mediterranean ecological conditions of Izmir, Turkey during two years in 2013-2014. The experiment was carried out with a randomized complete block design with three replication; five plant spacings 70 cm among the rows and 5, 10, 15, 20 and 25 cm within the rows (D1:285,714; D2:142,857; D3:95,238; D4:71,428 and D5:57,142 plant ha-1, respectively) were tested. 'Keller' cultivar of sweet sorghum was used as crop material. Some traits were tested in the experiment such as plant height, stem diameter, fresh & dry matter yields, sugar content, crude protein (CP) concentration, NDF and ADF contents. Average result of two years indicated that there were significant effects of plant densities on the fresh or dry matter yield and some forage quality parameters of sweet sorghum. Densely populated stands (D1 and D2) gave higher CP content compared to sparsely populated stands (D4 and D5). D3 was the most successful planting density of sweet sorghum regarding dry matter yield and crude protein yield to the regions with Mediterranean-type climates under irrigation, and it is recommended for production.

Keywords: Sweet Sorghum, Plant Density, Forage Yield, Forage Quality

A WIRELESS ROBOT ARM SIMULATING HAND MOVEMENTS

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Abstract:

This study was performed on the purpose of providing needs by giving access to robot arm remotely in environment that are undesirable for people or in chemical areas which can be damaged on human hands. In this work, a robot arm design simulating hand movements was designed. This robot was designed as Cartesian robot that can move in X, Y, Z axis linearly and that has arm holding and transportation properties. This robot works wirelessly as distinct of literature. Flex sensors was placed on a glove for every finger in order to provide simulating hand movements. Flex sensors are 4.5" namely 112,5*6,38*0,5 mm sizes and 0.5 g weight. They have resistance properties between 10-20 kiloohms. Data taken from fingers sends to control point wirelessly with a serial module card that has 2.4 GHZ telecommunication frequencies. A relay card with 8 channeled, 433 MHz wireless RF receptor was preferred for receiving and processing data coming from robot arm section. Micro servo motor has 0,1 sec/600 turning angle, 9 g weight, 23,1*12,2*29 sizes and 4,8 V-7 V working range. Arduino uno was chosen in the aim of system control. Arduino uno has atmega 328 microcontroller, 40 mA current, 25 g weight, and sizes of 68,6*53,4 *29 mm.

Flex sensors put up 10 kiloohm resistances when they are not twisted. However; this value can be up to 20 kiloohm as they are twisted. Thus, it can be understood that how much fingers are twisted and, accordingly, simulating robot provides running of servo motors that has 0,1 sec/600 turning angle and twisting fingers of arms in the same ratio, as well. Control was performed with designed algorithm and wireless duplexer via Arduino uno.

Keywords: Robot Arm, Arduion Uno, Wireless, Flex Sensor

APPROPRIATE USER ACCEPTANCE CRITERIA FOR NEW SOCIAL MEDIA SITES

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Abstract:

Nowadays social media sites have attracted a number of users and they have become the mostly commonly used websites for general public. These websites are used by individuals, small and even big organizations for various purposes, such as meeting your old friends, sharing your own experiences, sharing pictures and videos, promoting businesses, sharing knowledge etc. Their popularity is increasing at an increasing rate. User's needs are endless so there will be some new area for creating new social media sites. There are two main ideas for creating new social media sites. Firstly, one should identify the new needs of users which are not fulfilled by the current websites. Secondly, the new website must incorporate those features which are mostly liked by end users and add further functionality into the website that attract more users. It is really important to know the criteria based on which the users prefer one website over the other. Therefore, the objective of this study is to compare the use of social media and find the acceptance criteria that why an end user prefers one social media over the other. This user feedback based information will help social media developers to incorporate new user needs into future social media to increase user satisfaction. We performed experiments on data collected fifteen most commonly used and popular social media websites in current era. The test data were collected till May 08, 2016.

Keywords: Social Media Sites, Sloppy Mail, Accessing From Devices

THERMODYNAMIC ANALYSIS OF SIMAV GEOTHERMAL DISTRICT HEATING SYSTEM ASSISTED BY SOLAR ENERGY

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Abstract:

In this study, the usage of the evacuated tube solar collectors in a large district heating system was investigated. By this way, Simav geothermal district heating system, located in the southern part of the Simav graben system (39o latitude, 28o.4' longitude) at Kutahya province in western Anatolia of Turkey, were taken into account. The proposed system consists of four sub-circuits. The Circuit I is geothermal flow cycle which transfers the heat from the geothermal fluid (98oC and 400 kPa) to the heat exchanger, Circuit II is solar heat storage cycle which save the heat from getting the solar collector, Circuit III is district heating cycle and Circuit IV is residential heating cycle which utilize the radiator with an inlet temperature of 55°C and outlet temperature of 45°C. The effect of monthly solar radiation employing the different number of the solar collectors was evaluated in the proposed system in point of changing the parameter of the thermal energy storage inlet temperature using energy and exergy analysis. According to calculations, the number of heated residences by solar energy change between 384 and 1,363. The number of the used solar collector per the heated residence calculated between 4 and 16.

Keywords: Energy-Exergy Analysis, Geothermal, Solar Collector, District Heating.

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EVALUATING THE DETERMINANTS OF CUSTOMER LOYALTY IN THE TURKISH SMART PHONE MARKET VIA SAMSUNG SMART PHONE USERS

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Abstract:

The purpose of this study is to examine the effect of customer satisfaction on customer loyalty and to evaluate the effects of usage characteristics in the Turkish smart phone market through Samsung smart phone users. To test the research model, we collected data from 219 Samsung smart phone users via face-to-face and online survey. The results show that customer satisfaction is a significant influence on customer loyalty. The features of the device (functions, usability and design) and corporate factors (customer support and corporate image) significantly affect customer satisfaction.

Data collected from 219 respondents were tested using partial least squares Structural Equation Modeling (PLS) approaches. Results; Functional value, emotional value, social value and brand identification positively affect smart phone brand loyalty. In particular, this study investigates the level of customer satisfaction, loyalty, brand image, corporate image and impact on the source country.

This study includes t-test, factor and regression analyzes applied to an online and face-to-face questionnaire. The results demonstrate administrative and theoretical results for satisfaction and customer relationship management.

Keywords: Customer Satisfaction; Loyalty; Predictors; Results; Smartphone, Samsung

CONDITION MONITORING OF THE UNCOATED CARBIDE CUTTING TOOL IN TURNING PROCESS OF THE ALUMINUM ALLOY 6061 VIA VIBRATION SIGNAL ANALYSIS

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Abstract:

This study have been conducted in an attempt to monitor the changing of tool wear caused by increasing the cutting speed, depth of cut and feed rate. The signal processing analysis was done on the raw signal, the vibration signal then which is analyses by using MATLAB software. The relationship among several parameter of vibration signal, such as energy and maximum amplitude with cutting speed and depth of cut was studied. The material machined was Aluminum Alloy 6061 and uncoated carbide as a cutting tool. At the same time, the cutting temperature was also monitored. The results show that vibration signal can be one of the method to monitor tool wear in turning process via in-situ and therefore can be obtained useful for establishing the end of tool life in these operation. Based on the results the suitable speed and depth of cut range was identified to maximize the tool life.

Keywords: Cutting Tool, Turning, Vibration, Aluminum Alloy 6061, Tool Life

NUMERICAL INVESTIGATION OF MHD FORCED FLOW IN A THREE-DIMENSIONAL CYLINDRICAL PIPE

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Abstract:

In this work, laminar three-dimensional magneto-hydrodynamic (MHD) forced convection has numerically investigated. 3D cylindrical-pipe is under the influence of externally magnetic field. The wall temperature of channel is different from liquid temperature. Numerical study has analyzed for three different magnetic field strengths and without magnetic field but constant inlet velocity. The study has designed in ANSYS-WORKBENCH and has analyzed with the ANSYS-FLUENT commercial software. The working fluid has selected as lithium. As a result, the liquid lithium flow rate has seemed to be strongly influenced by of the magnetic field force.

Keywords: Magneto Hydro Dynamic, MHD, Forced Convection, Magnetic Field

EFFECT OF VARIOUS DRILL BITS ON THRUST FORCE IN DRILLING OF CARBON FIBER REINFORCED PLASTIC

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Abstract:

The usage of carbon fiber reinforced plastic is increasing day by day in several industries such as aerospace and automotive due to its high strength to weight ratio and perfect fatigue strength. Conventional drilling process is widely used to make a hole in a material and a hole is needed for assembly with rivet or bolt. In drilling process, thrust force is a crucial performance evaluation criteria since it effects machinability directly. Besides thrust force is responsible for delamination damage occurred during drilling of polymer composites. Therefore, thrust force occurred during drilling process must be reduced as far as possible. In this study, the effects of various drill bits that have three different geometry and cutting parameters on thrust force were experimentally investigated. The results indicated that thrust force decreased as cutting speed increased. In addition to that thrust force increased with increasing of feed rate. Whereas larger thrust forces occurred in drilling with drill bit C, lower thrust forces occurred in drilling with drill bit A. Maximum thrust force occurred at the combination of 0.18 mm/rev feed rate, 18 m/min cutting speed and drill bit C parameters. Minimum thrust force occurred at the combination of 0.06 mm/rev feed rate, 42 m/min cutting speed and drill bit A.

Keywords: Drilling, Carbon Fiber Reinforced Plastic

DESIGN OF BAND STOP FILTER WITH FREQUENCY SELECTIVE SURFACES ANALYSIS BY IMPLEMENTING THE GOLDEN RATIO RULE

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Abstract:

The designs which are made with frequency selective surfaces (FSS) analysis can be in different shapes and sizes. Square, round, plus, triangle, snowflake etc... are some of them. In this article, band stop filter (BSF) is designed by using frequency selective surfaces with the Golden Ratio Rule which is found by Fibonacci. In Golden Ratio Rule, each number is the sum of two numbers coming before that number and the ratio of every sequential number equals approximately 1.618, exact 1.618 at last. In design, Golden Ratio Rule is used while forming thickness, width and length. All of the simulations are run in CST Studio computer program between 700 MHz and 1700 MHz in frequency domain section. There isn't any active or passive components in the design. Only 80 cm X 130 cm copper plate and the shapes over it, the BSF with 1.35 GHz center frequency and 44 MHz band width frequency is formed and has become ready to perform. If shapes and sizes are changed while preserving the ratio, it can be reachable different center and band width frequency. After obtaining the operating frequency, the design will block the electromagnetic effects in accordance with BSF, and electric or magnetic waves cannot transmit from the copper plate, as a result; side effects which are harmful for human body can be stopped.

Keywords: Band Stop Filter, Frequency Selective Surfaces, Golden Ratio Rule

DESIGNING A VIVALDI FED ANTENNA FOR PASSIVE MILLIMETER WAVE IMAGING SYSTEM IN KA BAND

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Abstract:

This antenna will be used for Passive Millimeter Wave Imaging System (PMWIS) which has 35 GHz operating frequency described as Ka Band. The antenna should work in that specific frequency because of having low attenuation in that region according to frequency behavior in misty conditions. Antenna also should have approximately 50 ohm input impedance value so that perfect matching to the active circuits will occur. The input reflection coefficient, S11, has to be under -20 dB and the gain of the antenna, G, has to be over 10 dB value for better efficiency. Micro-strip Vivaldi Fed Antenna provides all of the conditions for imaging system was designed by using Antenna Magus Computer Program and later it was designed in detail with CST Computer Program. The last format of the Vivaldi Fed Antenna has -25 dB input reflection coefficient, 48.5 ohm input impedance and 12.3 dB gain for 35 GHz operating frequency. It is ready to connect to the low noise amplifier and detector, which are active circuits of the Passive Millimeter Wave Imaging System. At the end, the detector will be connect to the video amplifier and computer. The receiver of PMWIS is composed to the Vivaldi Fed Antenna connected to the other equipment will scan elevation and azimuth angles, as a result; the video amplifier will transfer the signals to the computer. Computer will show to the user the scanning area image. In this system, antenna is the most important section and particular attention was given to the antenna in this study.

Keywords: Vivaldi Antenna, Passive Millimeter Imaging, Ka Band

A CASE STUDY: THE EFFECT OF THE USE OF AUGMENTED REALITY APPLICATIONS ON BUILDING MARKETING PROCESS

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Abstract:

With the emerging technologies, virtual living spaces has become a part of daily life. Today, the line between the virtual and the real is getting blurry and virtuality leaves its place into a mixed environment between the real and the virtual. Tehcnologies like augmented reality (AR) enable many possibilities in many different fields. AR is formed by the combination of the real and the computer generated virtual objects in the real physical world. Today AR systems are used in many different fields like; education, medicine, games and commercials and military. The use of AR in architecture is increasing every day. The architectural design implementation is a interdisciplinary process where the architect, the client and other technical experts and engineers coexist. The AR, gives opportunity to observe the architectural designs in their real environments before they are built. With this feature, AR contributes implementation process positively. Especially the clients will be able to interact with the virtual architectural models in the real environment and will have the opportunity of examining them in many ways which will make them understand the designs better. Thus, problems based on marketing and client expectations will be solved before the implementation. Additionally production of designs that will meet the clients' expectations will be eased. In this study, the effect of the use of AR on architectural design marketing was researched. In this case study; 2D renderings and 3D AR models of the same design has been showed to the 25 clients which are chosen with random selection method. Afterwards, effectiveness of both methods is researched. Regarding to the applied survey results, the importance of the use of AR in architectural design marketing was determined. It's expected for this report to contribute especially the future works in this field.

Keywords: Augmented Reality, Architecture, Marketing Method

INFLUENCE OF HEAT TREATMENT ON THERMAL, MECHANICAL AND MICROSTRUCTURAL CHARACTERIZATION OF AL BASED MG-AL-SB EUTECTIC ALLOY

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Abstract:

Al based Mg-Al-Sb eutectic alloy was melted by induction furnace, and was casted into kokil mould. Then, samples were annealed at 573 K with vacuum furnace. The values of enthalpy of fusion (□ H) and the specific heat capacity (Cp) of the solid phase for Al based Mg-Al-Sb eutectic alloy were measured with DSC. The crystal structure parameters and the grain sizes for the tempered and the untempered alloys were investigated by XRD diffraction. The microhardness for the alloys was measured from approximately 5 different points with Vickers microhardness device. The mechanical properties of the alloys were obtained with compression test. Before and after deformation, the break surface morphology of the alloys were investigated by using Scanning Electron Microscopy (FESEM), and its compositions were determined by Energy Dispersive X-Ray (EDX) analysis.

Keywords: Heat Treatment, Spesific Heat Capacity, Enthalpy, Microstructure, Mechanical Properties

OPTICAL AND STRUCTURAL PROPERTIES OF ZNSE THIN FILMS WITH CHEMICAL BATH DEPOSITION

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Abstract:

Zinc selenide (ZnSe) thin films were deposited on glass substrate using the chemical bath deposition method at 80 C from aqueous solutions of zinc sulphate and sodium selenosulphide in which was employed as producing selenium source with solid selenium. The structural and optical properties of ZnSe thin films were analyzed at different pH. Optical properties such as transmission, reflectance, absorbance, refractive index and dielectric constant were determined using the absorbance and transmission measurements from Hach Lange 500 spectrophotometer, at normal incidence of light in the wavelength range of 300-1000 nm. From absorbance and transmittance spectra, the band gap energies were determined ranged between 2.08 eV and 2.35 eV. The hexagonal form was observed by XRD. The pH values were scanned at 8-11. Also, the film thicknesses were measured by AFM, and were reduced with increased pH.

Keywords: Znse, Chemical Bath Deposition, Thin Film, Ph Effect, Optical Properties

CONJUGATION OF ALDEHYDE DEXTRAN WITH HORSERADISH PEROXIDASE AND DECOLORIZATION OF SYNTHETIC DYE WASTEWATER

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Abstract:

This work is aim to conjugation reaction of Horseradish Peroxidase with aldehyde dextran and enzymatic decolorization of Reactive Blue 19 dye using the conjugate. Horseradish Peroxidase-aldehyde dextran covalent conjugate was synthesized in laboratory conditions. Aldehyde dextran was obtained from oxidation of dextran. With the conjugation, Horseradish Peroxidase enzyme is immobilized on aldehyde dextran and the effect time of the enzyme is maximized. The conjugate was characterized with Gel Permeation Chromatography. Enzymatic decolorization of Reactive Blue 19 dye carried out with Horseradish Peroxidase and the conjugate at pH:5.5 and different temperatures (21 °C, 33 °C, 37 °C, 43 °C, and 47 °C).

Keywords: Aldehyde Dextran, Conjugation, Decolorization, Horseradish Peroxidase

THE EFFECT OF HYDRAULIC RADIUS ON AERATION PERFORMANCE IN HIGH-HEAD GATED CONDUITS

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Abstract:

The water is indispensable to balance the ecology and functionality of creatures. Hence, water has been used for drinking water supply, irrigation, and various industrial purposes. In the historical process, we are confronted with the "global water crisis" due to the population increase, urbanization, increasing water consumption with industrialization, environmental pollution caused by mixing of waste water to the nature, inadequacy of infrastructure and excessive irrigation in agriculture. The effectively use of freshwater bodies has crucial importance due the limited amount of freshwater sources. Thus, it is vital to improve the properties of polluted freshwater to reuse. The dissolved oxygen concentration is a crucial indicator for continuation of live on the water. There are many researches to keep concentration of dissolved oxygen in the limit level. The aim of these researches is the aeration of water in the most efficient way. Thanks to the aeration, very long distance and time of oxygen transfer in the natural environment will be provided in a short distance and time. In this direction, different flow systems with pressure and free surface for aeration have been widely used in recent years. The main purpose of these systems is to increase the amount of air in contact with water to transfer of oxygen in the air. In this study, the variation of air demand ratio with hydraulic radius in high-head gated conduits was investigated differently from the previous researches. The results of experiments show that, air suction performance decreases with increasing hydraulic radius in small gate openings, and hydraulic radius does not have a significant effect on air suction performance in large gate openings.

Keywords: Aeration Efficiency, Air Entrainment, Hyrdaulic Radius, High-Head Flow, Oxygen Transfer

SULFATE RESISTANCE OF POLYPROPYLENE FIBER REINFORCED CONCRETE

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Abstract:

In this study, sulfate resistance of polypropylene fiber reinforced concrete was investigated. For this purpose, two series of concrete mixtures having 0.45 water/cement ratio were prepared. A CEMI 42.5 R type portland cement and crushed limestone aggregate having a maximum particle size of 25 mm were used. The gradation of combined aggregate, obtained by mixing 60% 0-5 mm, 20% 5-15 mm and 20% 15-25 mm aggregate size fractions (by mass) was confirmed with standard gradation limits. In addition to the control mixture containing no fiber, concrete mixture containing 0.4% by volume polypropylene fiber with 5 mm length was produced. In all mixtures, cement content and slump value were kept constant as 350 kg/m3 and 120±20 mm, respectively. A polycarboxilate ether-based high range water reducing admixture was used for providing the desired slump value. The slump loss of concrete mixtures within 60 minutes was measured in 20 minutes time intervals. 7 and 28-day compressive strength of concrete mixtures were measured on 150 mm cube specimens. The mm prism specimens were prepared for sulfate resistance tests. The specimens were immersed in 5% sodium sulfate solution. The length changes of concrete samples were measured every 30 days until 150 days. According to test results, the required water reducing admixture content for providing desired slump value increased by adding polypropylene fiber into the concrete mixtures. Utilization of the polypropylene fiber has not significant effect on compressive strength of concrete mixtures. However, length changes of concrete mixtures arisen from sulfate attack decreased by using fiber.

Keywords: Concrete Mixture, Fresh Properties, Compressive Strength, Sulfate Attack, Polypropylene Fiber

TRANSPORT PROPERTIES OF MORTAR MIXTURE CONTAINING METAKAOLIN

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Abstract:

In this study, effect of utilization of metakaolin on fresh and transport properties of mortar mixture was investigated. For this aim, 5, 10 and 15 wt% of cement was replaced with metakaolin. In all mortar mixtures, water/cement ratio, sand/binder ratio and flow value were kept constant as 0.485, 2.75 and 250±20 mm, respectively. A naphthaline-based water reducing admixture was used for providing desired flow value. The changed in the flow values of mortar mixtures in 15 minutes time intervals up to 60 minutes were measured. 1, 3, 7, 28 and 90-day compressive strength of mortar mixtures was obtained on 50 mm cube specimens. In addition, transport properties of mortar mixtures was determined by monitoring of 3 different tests such as water absorption, water sorptivity and chloride ion penetration at the end of 90 days curing. According to the test result, fresh properties of mortar mixture were affected negatively upon using metakaolin. Mentioned effect was more pronounced by increasing replacement level of metakaolin. In spite of having lower early compressive strength, mortar mixtures containing metakaolin showed higher compressive strength compared to control mixture beyond 28 day. The fact is reported to be both due to the physical pore-filling effect and to the pore refinement upon formation of additional C-S-H through pozzolanic reaction. Besides, Transport properties of mortar mixtures improved by using metakaolin. It was more pronounced by increasing metakaolin content.

Keywords: Mortar Mixture, Metakaolin, Water Absorption, Water Sorptivity, Chloride Ion Penetration

ANDROID BASED MOBILE C# PROGRAMMING EDUCATION APPLICATION

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Abstract:

Computer technology is improving day by day and software is one of the most important parts of it. Software can be called as group of special codes written for a specific purpose. Operating systems and application programs are examples of software. Software are produced by using different programming languages known as high level (C#, Java, Python languages), mid-level (C, IBM PL/S languages) or low level (Assembly language, Machine language) programming languages. Algorithm is the start point of programming. A novice programmer should learn designing algorithm at first. After designing the algorithm, it is turn to code the algorithm in a specific programming language which can be selected according to many criteria like supporting object orientation, platform independency, systems requirements and etc. As learning algorithms and programming are the basics of software world, many sources like books, tutorial videos, web sites and courses have been published in the world to teach these subjects. Programming education is so important both for improving the capabilities of programmers and creating better qualified software. Smart phones with mobile operating systems are one of the popular technologies of today. Many people using mobile phones prefer using smart phones with internet connection for the advantages of using many applications created for different purposes like instant messaging applications (WhatsApp), banking applications, games (local or internet connected) etc. As smart phones are widely used and learning computer programming is a popular trend in computer world not only for computer engineering students but also for many young people on different area, we have developed an Android based mobile C# programming education application to support novice users on training C# programming.

Keywords: Android Based Education, C# Education Application

LOGICAL KEY HIERARCHY IMPLEMENTATION IN CLOUD COMPUTING

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Abstract:

Cloud computing is a system that keeps the system, software or data contained in remote data centers and enables them to access at a desired time and on a desired device over the internet. Various schemes have been developed to transmit the data to multiple users by a single sender. The most commonly used among these schemes is Logical Key Hierarchy (LKH). In this study, the problems that can be encountered during the implementation of LKH structure in a cloud system are presented.

Keywords: Cloud Computing, Logical Key Hierarchy, Broadcasting

A NEW TITANIUM MESH CAGE DESIGN FOR LUMBAR SPINE STABILIZATION FOLLOWING CORPECTOMY

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Abstract:

Corpus of a vertebra transmits the 80% of the axial load and therefore it has a critical importance for the stability of spine. This part of vertebra can become malfunctioned due to various reasons and removal of this part (corpectomy) may be inevitable in some cases such as trauma or tumor. Titanium mesh cages (TMC) are widely used in stabilization of spine followed by corpectomy and bone grafting in TMC to create a fusion between vertebras may be required for better stabilization. Various designs of cages are available for application, however, biomechanical characteristics of stabilized spine is not examined in detail in literature.

In this study, a healthy human lumbar spine with L1-L2-L3 segment including the intervertebral disks and all ligaments is modeled mechanically using Finite Element Method (FEM). A stabilized segment with corpectomy of L2 followed by cage and bone graft insertion is also analyzed again using FEM. The integrity of cage for all possible motions; left/right bending, flexion/extension, torsion and compression are considered in biomechanical investigation. The cage is designed with re-entrant cell shape which brings the unique characteristic known as the auxeticity.

When the healthy spine and stabilized spine is compared for all motions, stabilized spine with auxetic TMC+Bone Graft presents very close stress distribution only with slightly higher stress values in stabilized model. This is a desired situation because lower stress values may lead weakening of bones in recovery stage. These results indicate that auxetic mesh cage and bone graft contributes the stability of spine significantly and can be alternative method for spinal fixation. It also brings the advantage of auxetic structure where cage will contract itself under high compressive loadings where it will avoid moving towards the posterior region of cage and protect the spinal cord under traumatic or progressively improving instabilities.

Keywords: Spine, Titanium Mesh Cage, Auxetic, Finite Element Method

FINITE ELEMENT MODEL OF LUMBAR SPINE STABILIZATION WITH BONE GRAFT SUPPORTED TITANIUM MESH CAGE

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Abstract:

Clear understanding the biomechanics of spine stabilization is very important to overcome the issues related to stabilization techniques and advancing new techniques. Titanium mesh cages (TMC) are extensively utilized in stabilization with bone grafting in and out of TMC to create a better fusion between vertebras. 41% of stabilization operations following corpectomy, a.e. removing the corpus of a vertebra due to some medical conditions, take place in lumbar area. In this study, both intact and stabilized L1-L2-L3 segment (L2 having corpectomy) are modeled with finite element method (FEM) to explain differences in stresses and deformations occurring as a result of stabilization. For TMC, a commercially available cage model with circular holes is used in FE Models. Also, TMC is supported with bone grafting in stabilization and all ligaments kept intact in stabilized model except anterior and posterior longitudinal ligaments. All material properties for bones, ligaments and cage are taken from literature. Structural integrity of cage for all possible motions; left/right bending, flexion/extension, torsion and compression are tested by compering FE Analysis results for both intact and stabilized models. When the intact and stabilized spine is compared for all motions, stabilized spine presents close Von-Misses stress. Maximum value of Von-Misses stress value in L3 is slightly higher in stabilized model. However, this is not an undesired situation because lower stress values may weaken bones in recovery stage. Maximum displacement values are almost same for both intact and stabilized models.

Keywords: Finite Element Method, Spine Stabilization, Titanium Mesh Cage,

AGENT-BASED MODELING AND SIMULATION OF THE SUNN PEST - WHEAT RELATION AND OF THE STRUGGLE AGAINST SUNN PEST IN TURKEY

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Abstract:

Wheat is a cereal of which agriculture has primarily been done and which is an important nutritional source for people. One of the most important problems encountered in wheat cultivation is plant mites. In this study, the struggle being performed against sunn pest, a plant mite, has been modelled in the virtual platform. Various methods have been used in the struggle against the sunn pest in our country and in the world. The effect of these methods on the sunn pest and wheat has not been simulated up to this time in the computer platform, that's why this project has arisen. In this project, the biological life cycle of the sunn pest and its effects on wheat during its active periods, the chemical and biological struggles performed were modelled after the relevant literature scan has been carried out, and were programmed in Repast Symphony 2.1 agent-based simulation platform,making use of the agents, a new generation programming paradigm. The biological growth stages of sunn pest and wheat have primarily been modelled in this study.As a result of the struggles simulated in the virtual platform, the amount of variability of the sunn pest and yielding wheat output were analyzed graphically. Biological developmental stages of the sunn pest and wheat can be observed throughout the simulation. From the findings of this study, the epidemic years of the sunn pest and the damage it will cause in future can be estimated. Making contribution to agricultural researches has been targeted by this project.

Keywords: Sunn Pest, Wheat, Predator, Agent Based Modeling And Simulation

MODELING AND SIMULATION OF THE RESISTANCE OF BACTERIA AGAINST ANTIBIOTICS

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Abstract:

Nowadays, the unnecessary use of antibiotics comes up as an important health problem. Unnecessary and inappropriate use of antibiotics causes antibiotic resistance which has become an important problem in the community and in hospitals. Antibiotic resistance causes antibiotic to lose its ability for killing a particular bacteria or blocking its reproduction.This issue lead to the increase in the number of patients suffering seriously from both society- induced and medical infections, and the failure of treatment,even cases resulting in death.While the resistant bacteria continue to increase, surviving against antibiotic; it causes for disease to last longer, prolongation of treatment and cost increase. It was aimed in this study to investigate the interactions among the bacterias, immune system cells and antibiotics in a Repast Symphony 2.1 agent based simulation environment, having been modelled, and to observe the effects of variability of antibiotic resistance on the infection process. We have found as a result of the study that the increase of antibiotic resistance has become a serious threat against the results of the treatment of bacterial infections.

Keywords: Agent Based Modeling, Simulation, Antibiotic Resistance, Immune System

USING MACHINE LEARNING TECHNIQUES ON PREDICTING WASTAGE AMOUNT IN TEXTILE FACTORIES

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Abstract:

Textile enterprises have a variety of processes for the processed fabric. Production of colored fabrics, which have dye or hem, completed through wide range of processes. Due to this process variety, faulty product problem inevitably arises. It is extremely important in terms of cost and profitability of the enterprise to predict this wastage which occurs during the manufacturing of processed fabrics.

This study provides information about machine learning techniques, which is one of the important work area of computer science and artificial intelligence, and also informs how to use of these techniques in order to predict wastage in the textile business. Also, the test results of a sample machine learning technique for estimation of wastage is evaluated. Subsequently, some recommendations are given how to other machine learning techniques can be used.

Keywords: Predicting, Textile, Wastage, Machine Learning, Data Mining

INFORMATION SECURITY RISK ASSESSMENT IN HEALTH INSTITUTIONS AND MEASUREMENT OF USERS' AWARENESS ON INFORMATION SECURITY

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Abstract:

With increasing dependence on developing technology and computer use, national and international laws and obligations, along with the increasing risks today's information security has been a critical issue. Attacks on information systems, destruction of information and the information falling into the third parties indicate the size of the risks.

This study was aimed to make a risk assessment of information security for the purpose of measuring the level of information security awareness of users working at two different health organizations located in Adana.

In the study, 251 persons have been taken part in the survey and the threat level was determined according to the information systems users in hospitals. The collected data was analyzed with using SPSS software in order to find out the highest level of risks and list the threats according importance and existence. The relationships between these threats and individual's age, gender, educational background, professional experience, levels of computer information and information security have been revealed.

As a result, the most important threat was sharing password according to the users. The other threats were respectively : leaking patients' health information, sabotage and lack of ensuring information security system.

Information security is a critical issue for all employees and especially for managers. For this reason, information security policies should be developed by institutions, these policies should be shared with all employees and information security awareness training should be given to users.

Keywords: Information Security, Information Systems, Risk Management In Information Systems, Health Organizations, Survey

RECENT DEVELOPMENTS ON ENZYME IMMOBILIZATION

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Abstract:

Enzymes are biocatalysts which are mostly biomolecules found in protein structure. Also, they can include metal atom at the active center. Immobilization of enzymes onto solid natural and synthetic polymer supports or inorganic porous compounds for the treatment of aromatic compounds have many advantages. In addition to enhanced stability, enzymes can acquire additional advantageous properties by immobilization such as (i) immobilized enzymes can be reused, (ii) easily separated from other chemicals (iii) reduced operational cost, (iv) fast termination of reactions. Immobilization of enzymes is a method that is being applied to impart streng than durability to them. Soluble enzymes can be used longer time, especially soluble enzymes. So enzymes can be feasible for industrial applications. Especially for covalent type, in immobilization, the appropriate functional group must be selected or formed in order to bind the enzyme to the carrier. Enzyme immobilization articles are boosted especially after 2004. Also, citations of enzyme immobilization are very popular topics. In this work, recent trends were explained in enzyme immobilization methods and applications.

Keywords: Enzyme, Immobilization, Stability, Trends

DO TURKISH CONSUMERS PREFER CONVERGED PRODUCTS? SMARTPHONE EXAMPLE

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Abstract:

The smartphone market is facing a huge growth in the last few years, now reaching a sales projection for 2017 close to 15 million which makes Turkey one of the top ranked countries in smartphone market growth. Convenience and personalization are the main features of the Smartphones. Newer generation convergence products (all-in-ones, camera phones) offer consumers high quality product performance that rivals their dedicated versions. This increased availability of options starts another dilemma in the minds of consumers about purchase consideration. This paper investigates the choice patterns of Turkish university students for product forms (converged vs. dedicated) in different technological performance levels. In the end, managerial implications are addressed and directions for future research are suggested, as well as comparison of the results to previous studies.

Keywords: Smartphone, Converged Product, Dedicated Product, Technology Convergence, Turkey

COMPARISON OF MACHINING CHARACTERISTICS BETWEEN AA 6082 AND AA 6082 T6 MATERIAL WITH CRYOGENIC COOLING

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Abstract:

In this study, AA 6082 and AA 6082 T6 material were machined by using different cutting parameters. Here the tool geometry (tip radius and rake angle) , cutting speed, feedrate factor is used as the main variable. 134a refrigerant gas was used for cryogenic cooling. Surface roughness measurements were made to determine the most appropriate cutting parameters. As a result, it was decided to determine the best cutting conditions with optimal parameters .

Keywords: Machining, Cutting Al Alloys

CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT IN TURKEY

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Abstract:

Migrations from rural areas to cities has been increasing in many parts of the world, especially in developing countries. This situation has led to an increase in construction, demolition and renovation works. Today, around 50% of the consumed products and 45% of generated solid wastes are related to the construction sector. Turkey has initiated urban transformation activities around the country with the law promulgated in 2012 and amount of C&D waste has been growth rapidly. The purpose of this study is present current C&D management system in Turkey. In this context; first definition and type of C&D wastes are given. Then, information about amount of C&D waste collected is given and some estimations were done when they were necessary. C&D waste management methods are explained and finally C&D waste management in Turkey is evaluated. C&D waste management regulations prepared by Ministry of Environment and Urbanisation and practice by city and district municipalities. Totally, 67 million ton C&D waste and excavation soil were produced only in Istanbul and according to estimations 130 million ton was produced across the country in 2013. It is expected that 150 million ton C&D waste and excavation soil will be produced in Istanbul in 2033. Currently reuse and recycling ratios are below the targets but with urban transformation activities and regulations they will increase.

Keywords: C&D Waste, Management, Recycling, Regulation.

THE INVESTIGATION OF DISCHARGE COEFFICIENT FOR DIFFERENT UPSTREAM CREST LENGTHS IN TRIANGULAR LABYRINTH SIDE WEIRS

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Abstract:

Weirs are the most simple hydraulic structures in terms of practical and the oldest used for centuries for purposes such as flow measurement and flood control. There are three main types: sharp-crested, broad crested and labyrinth weirs. It is also classified in the form of overflow weirs and side weirs. It is observed in literature reviews that there isn't any flow in side weirs, high froude numbers, part of the upstream crest lenght. This leads to decrease of dischange capasity. For this purpose a series of experiments have been carried out for different upstream crest lengths. Thus, the main purpose of this study is to examine in detail the effect of the change of the upstream crest length in sharp-crested labyrinth side weirs on the discharge capacity. Present experiments have been carried out on a triangular section with a 0.25 m weir lenght in the straight channel and a 45 degree apex angle for 0.12, 0.16, 0.20 m crest heights. The weir upstream crest lenght was closed and readings were taken in three stages at each crest height. The experiments were carried out by taken a flow change of 8-145 L/s and froude number of 0.08-0.90. The experiments have been carried out under subcritical flow regime and steady flow conditions. Readings were obtained for mininum 30 mm nape thickness, Froude numbers and discharge coefficients were calculated and necessary graphics were plotted. De Marchi method was used in this study. It has been determined that there is decrease in discharge coefficient as a result of the study. Parallel to the differences in comporison to the process and methods applied in the literature reviews, the study in terms of both theoretical and experimental basis will make a significant contribution to the subject of triangular labyrinth side weirs.

Keywords: Straight Channel, Discharge Coefficients, Side Weirs

CREATING ALTERNATIVE PRODUCTION LINES BY USING SIMULATION TECHNIQUE IN APPAREL PRODUCTION

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Abstract:

In this study, discrete-event system simulation technique is used in order to create a smooth work flow in t-shirt production line. In accordance with this purpose; work flow of t-shirt model is created, input data is collected by using time study in order to determine statistical distribution of all operations by using Stat-fit for Simul8 software. Model translation phase is executed in Simul8 Software. Then for the purpose of verification & validation process, actual system data and simulation model outputs are compared statistically by using normality test and two-sample t-test in Minitab Software. Once the simulation model of the actual system is properly validated, alternative models which are considering less operators in order to acquire more output and have a smoother line balance are generated. Finally, to analyze the difference of alternative models, two sample t-test is performed. The best alternative model is selected by considering output rate per operator.

Keywords: Apparel Industry, Simulation Technique, Productivity, Line Balancing

A MODAL ANALYSIS OF TLP WITH TENDONS

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Abstract:

The offshore industry requires continued development of new Technologies in order to produce oil in regions, which are inaccessible to exploit with the existing technoogies. Tension leg platforms (TLPs) have been used exclusively as production and drilling platforms. TLPs consist of columns and pontoons. The unique feature is the mooring system, which consist of vertical tendons (called “tethers”) which restrain the heave motion. Compliant offshore TLPs are essentially meant for deep oil/gas exploration and are usually constructed on the seashore and then towed down to the particular location for anchorage. They are connected to the sea bed by means of pretension cables. The increased use of TLPs in deep waters and necessity of reduction of usually high value of pretension make the effect of variable tension in the tether dynamics more significant. This work presents the modal analysis of tethers and TLPs considering the linearly varying tension along the tether length. For the analysis, the TLP which name is SNORRE-A is modelled for environmental conditions. ANSYS-Mechanical APDL program is used for modelling and analysis. The mod shapes and natural frequencies of TLP is obtained and the results are discussed.

Keywords: Ansys, Offshore, Tlp, Tendons

DESIGN AND ANALYSIS OF LIGHT QUADCOPTER BODY

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Abstract:

In this study, it was aimed to draft the body desing and analyse the quadcopters, which is a four-motor multicopter, from composite material. The body design of the quadcopters produced in this project was done using SolidWorks program and only static analyses were carried on Ansys Workbench. The method manufacturing product was determined after the design was made and then the composite materials required were selected and supplied. After these processes, the manufacturing phase was started. The prepereg, which is resin-impregnated fibre was glued to the polyurethane foam (Airex T92.80) with epoxy, after being treated in the hot press and pressed again, so that the designed body was produced from the sandwich panel.

Keywords: Ansys Workbench, Composite Materials, Multicopter, , Solidworks, Quadcopter

EFFECTS OF SELECTIVE LASER SINTERING (SLS) METHOD ON MICROSTRUCTURAL FEATURES OF TI6AL4V POWDER ALLOY

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Abstract:

Additive Manufacturing is one of the methods of modern (non-traditional)manufacturing. The fundamental of this method is based on adding materials layer by layer on top of each other. The purpose of this method is manufacturing the parts that cannot be manufactured by traditional machining process because of their geometrical complexity, disposing the limits of manufacturing. Nowadays Laser Sintering and Melting machines can rapidly manufacture the parts that cannot be manufactured by traditional machining process because of their geometrical complexity in many fields by using various metal powders.

In this article, test specimens were manufactured via Selective Laser Sintering of Additive Manufacturing Method by using Ti6Al4V metal powder. Test specimens were manufactured via SLS method, different maching parameters as laser power, laser hatching speed, hatching distance and in various energy density values based on these parameters by their island and grid hatching strategies. After the grinding, polishing and etching processes of Ti6Al4V alloys that were manufactured with different machining parameters via SLS method, in their microstructural analysis, pore distribution and dimension, α/β phase transformation were examined. Besides, EDX elemantal analysis was performed. The results were benchmarked. Findings were compared with the literature.

Keywords: Additive Manufacturing, Selective Laser Sintering, Ti6al4v, Microstructure

DETERMINATION OF AIR PERMEABILITY PROPERTY OF AIR-LAID NONWOVEN FABRICS USING REGRESSION ANALYSES

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Abstract:

Nonwoven fabrics are defined as textile products which are produced as textile sheets from staple or filament fibers and entangled by mechanical, chemical, thermal processes. Products from nonwoven fabrics are widely used in application areas such as hygiene, medical, agriculture, civil, home textile, automotive, filtration, ready-made production, food packaging. With wide variety of application areas and production techniques, nonwoven fabric production rate is increased day by day in Turkey, and the production is carried out in Gaziantep, Istanbul and Corlu, predominantly. Airlaid nonwoven fabrics are generally used for hygienic care products such as diaper, adult nappy and sanitary napkins. Air permeability is one of the foremost properties that affect the usage performance of hygienic care products. The structural properties of airlaid nonwoven fabrics; thickness, weight, fiber type and the pore size influence air permeability performance with a wide range. Among these properties, pore size is the determinant parameter for air permeability property. Since this type of fabrics have thin structure, determining the pore size properties by using image processing techniques seems possible. In this study, 17 different airlaid nonwoven fabric samples are produced. The pore sizes of these samples are determined by digital image processing methods. Pore sizes of the samples are calculated as the proportion of covered area of the fabric to the total area. In order to get a reliable data, five image frames are acquired from different regions and analyzed. Air permeability of the samples is tested by digital air permeability test device. Then regression analyses were applied to the experimental results using SPSS 21.0 package program. Finally regression equation was obtained for prediction of air permeability by using thickness, weight, fiber type and the pore size parameters, before production.

Keywords: Airlaid Nonwovens, Air Permeability, Pore Size, Image Processing, Regression Analysis

DEVELOPMENT OF A TEST DEVICE CAPABLE OF PERFORMING STATIC LOADING TESTS OF CARPETS AUTOMATICALLY

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Abstract:

The appearance of the cut-pile carpets are deteriorated due to foot traffic and long time heavy loadings. The most important factor affecting appearance of carpets is thickness loss after static loads due to being under furniture for long time. There are two standards; "BS 4939:1987, ISO 3416-1986 Method for determination of thickness loss of textile floor coverings after prolonged heavy static loading" and "ISO 3415:1986 Textile floor coverings - Determination of thickness loss after brief, moderate static loading" for testing carpet thickness loss performance after static loading. In today's technology, the static loading is applied manually to the carpet sample by means of a moment arm. Two loading masses (700 kPa for prolonged-heavy static loading and 220 kPa for brief-moderate static loading) must be prepared and the loading time required in related standards is followed by the user. On the other hand, for both standards it is required that the static loading must be applied on at least five specimens of a sample. Since static loading duration is 24 hours for prolonged-heavy static loading and 2 hours for brief-moderate static loading for each specimen and only one specimen can be applied on the moment arm, the test duration for one carpet sample take very long time. This time consuming due to tests' duration cause to serious problems in terms of carpet manufacturers whereas long time is needed to take test results for academic studies. In the scope of this study, a carpet static loading test instrument which is capable of performing static loading on five different specimens at same time according to both of two standards; BS 4939:1987 and ISO 3415:1986 will to be developed. Thus, static loading tests can be performed automatically an in shorter time durations.

Keywords: Carpet, Pro-Long Heavy Static Loading, Brief Moderate Static Loading, Automation, Carpet Static Loading Test Device

CONTROLLERS DESIGN FOR A REAL-TIME SEPIC CONVERTER

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Abstract:

Voltage regulators is used to provide a reference voltage for a circuit. The most efficient method of regulating voltage is with a DC/DC converter such as Buck converters (only reduce voltage), Boost converters (only increase voltage), Buck-Boost converters and SEPIC (Single Ended Primary Inductance Converter) converters. When the reference output voltage is in the range of input voltage, it is best solution to choose a converter that can increase or decrease the voltage like SEPIC. Due to the fact that there are two capacitors and two inductors, the SEPIC converter is a fourth order, non-minimum phase non-linear system. Therefore,effects of operating conditions and variations on load make difficult to control.

The purpose of this study is to designand control a real-time SEPICconverter instead of other DC/DC converters. For this purpose, the output of the SEPIC, which is triggered by the duty cycle of the control transistor, is controlled using nonlinear model predictive control (NMPC) approach where satisfactory stabilization results are obtained. According to real-time application results, the mathematical model of the SEPIC is verified by NMPC without a comparison of the other control methods.

Keywords: Nonlinear Control, Sepic Converter

MONITORING AND ANALYSING OF LOOMS TO IMPROVE PERFORMANCE OF WEAVING HALL

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Abstract:

Efficiency of weaving machines is a very effective parameter on the cost of productions. In this study, in order to improve the performance of a weaving hall, data are gathered from looms individually and collected in a central computer by the designed system which is implemented real textile industry in Denizli in Turkey. Thus the statuses of all looms in weaving hall are monitored on-line on the screen of the central computer and an increase on the performance of weaving hall is achieved by analyzing these data.

Keywords: Monitoring, Improving Performance, Weaving Machines, Embedded Systems

MECHANICAL AND COMFORT PROPERTIES OF FABRICS PRODUCED WITH HOLLOW YARNS

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Abstract:

In the scope of this study, core yarns in the yarn count of 59 Tex were produced by using cotton, viscose, and poliester fibres in the mantle and different ratios of polyvinylalcohol(PVA) in the core. After completion of yarn production on ring spinning frame, winding process was performed in order to get packages. These yarns in the form of packages, were used to produce plain knitted fabrics. Single jersey fabrics were produced on laboratory typed knitting machine and after the fabric production, fabrics were divided into two classes according to washed and non-washed fabrics. Washing process was performed in order to remove PVA-core from the yarn structures to obtain hollow yarn structure which will enhance the comfort properties of the fabrics produced with these type of yarns whereas will influence negatively the mechanical properties of the fabrics. The comfort and mechanical properties of washed and non-washed single jersey fabrics were measured under standard laboratory conditions. These performed tests were mass per unit area, air permeability, water vapour permeability, wicking, pilling and bursting strength. As a result of these tests; it was observed that before and after washing process, results of air and water vapour permeability, wicking, pilling, bursting strength test measurements are significantly influenced by the mantle-core proportion. In this way, due to high permeability characteristics of fabrics made of hollow yarns have been determined that it may be used for sports clothing.

Keywords: Core Yarn, Hollow Yarn, PVA, Air Permeability, Water Vapour Permeability, Wicking, Pilling, Bursting Strength.

AN ADAPTATION OF MATRIX ENCODING TECHNIQUE FOR DATA HIDING IN RGB IMAGES

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Abstract:

Hiding data in a digital medium is a modern form of steganography which aims to create an inconspicuous structure by embedding the message to be transmitted into an ordinary cover object. A digital image file is a popular choice for steganographic applications, since it can be found and shared commonly on the Internet. Image steganography methods hide the message data into the cover image by altering the values of bits in the image's pixels. Each single pixel in an image file with RGB color space has certain clusters of bits which correspond to red, green and blue color values. When embedding secret data bits into an RGB image, as in any application of steganography, it is important to ensure that the resulting stego-image has sufficient imperceptibility. Researches and studies on image steganography have lead to the development of techniques that are specialized in making the stego-images less perceptible to both human vision and computerized steganalysis methods. Matrix encoding, which enables to make less changes while message bits are embedded into the cover image, is a special technique that is proven to be an effective solution for the imperceptibility improvement problem. This study proposes an adaptation of matrix encoding technique to be performed in spatial domain image steganography for embedding data into an RGB image with an improved rate of imperceptibility.

Keywords: Image Steganography, RGB Color Space, Matrix Encoding

COMPARATIVE ANALYSIS OF WEB APPLICATION SECURITY SCANNERS

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Abstract:

The websites that are used for social activities make our daily life easier but we are likely to be hurt by them because of their unprevented security risks. In particular, most web application owners do not have information about the security requirements of web applications. For this reason, many tools have been developed for web application developers, security experts and web site owners to ensure the security of their websites. In this study, functional and behavioral analysis of W3AF, Paros Proxy, Grabber, Arachni Scanner, Skipfish and Vega web application security scanners is performed for scanning their security vulnerabilities such as SQL Injection, Cross Site Scripting, etc. The results are presented to show the effectiveness level of the web application development processes that include the security analysis with current tools. In addition, the strengths and weaknesses of these applications in different cases are reported. Certain questions about which features that a good web application security scanner should include have been tried to be answered by unifying the complementary features of the missing aspects of these tools and their good aspects.

Keywords: Website Security, Vulnerability Scanners, Website Vulnerabilities

NUMERICAL ANALYSES OF A HEAT EXCHANGER IN A THERMAL ENERGY STORAGE SYSTEM

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Abstract:

In this study, a numerical calculation has been performed to compare the experimental results in the literature. In this respect, thermal behavior and heat transfer characteristics of Paraffin Wax (melting point between 45◦C and 51◦C) as the phase change material (PCM) have been investigated during constrained melting and solidification processes inside a shell-and-tube type of heat exchanger. Due to PCMs low thermal conductivity, the influence of fins applying in the heat exchanger has studied for enhancing the heat transfer in the melting processes. Two-dimensional transient numerical simulations have been carried out using the ANSYS Fluent 16.2 commercial software package. The simulations results have indicated that as the lenght of fins increases, the heat transfer increases and the melting time decreases. Furthermore, the lenght of fins and natural convection play important roles during the melting process.

Keywords: Latent Heat Energy Storage, Phase Change Material, Melting, Fins

EXTRUSION AND COMPARATIVE INVESTIGATION OF PRISTINE AND NANOPARTICLE ADDED POLYPROPYLENE FILAMENTS FOR PIEZOELECTRIC SMART TEXTILE APPLICATIONS

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Abstract:

Polymer-based piezoelectric materials are good candidates for smart e-textile applications. However, there is a limited number of polymers which can exhibit piezoelectric effect. Researchers have been working on both finding new polymers/copolymers and increasing the piezoelectric behaviour of existing polymers. This presentation will focus on nanoparticle addition into isotactic polypropylene (PP). Three sets of PP filaments were extruded via a laboratory scale sigle-screw melt extruder. Pristine PP, 1wt% Multiwalled Carbon Nanotube (MWCNT) added PP and 1wt% Tourmaline (TM) added PP filaments have been successfully produced. Masterbatch preparation, filament extrusion and sample preparation processes have been studied. Masterbatches were prepared via a ThermoFisher Scientific Prism EuroLab16 twin-screw compounder. Filament extrusion and sample preparation parameters were kept the same for each set of filament. Filaments were subjected to a high voltage (15kV) during the filament formation in the drawing area at an elevated temperature. Mechanical and thermal characteristics of the produced piezoelectric filaments have been comperatively investigated. The evaluation results of peak-to-peak voltage output of produced filaments upon an applied mechanical stimulus have been reported. A comparative investigation has been done for the produced filaments and fiber composite samples. The results showed that both MWCNT and TM added composite PP filaments generated higher peak voltages under an applied constant impact as compared to pristine PP filaments. The highest peak voltage output was observed on 1wt% TM added PP filament while the peak voltage output of 1wt% MWCNT added PP filaments were in between the TM added PP and pristine PP filaments. This experimental study reveals that appropriate nanoparticle addition can contribute further the voltage generation of the polymeric piezoelectric materials. These produced smart filaments can easily be integrated into textile structure for smart textile applications.

Keywords: Piezoelectric, Filament Extrusion, Voltage Generation, Smart Textiles

VOLTAGE OUTPUT AND CURRENT DENSITY OF 3-D PIEZOELECTRIC FABRIC UNDER VARIOUS APPLIED LOADS

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Abstract:

Increasing energy demand have led to a significant increase in the experimental works on energy harvesting. Material engineers are now intensively working on either finding new ways for green energy generaton or improving the energy output of the existing energy harvesting materials. Concurrently, a new area of research for textile engineers too has opened up, wherein the photovoltaic and piezoelectric materials are now being used in textiles to produce ligth weight, flexible wearable energy harvesting structures. Think of how many hours people are physcially active during the day and how much mechanical energy hence produced is wasted. This has encouraged researchers to used this wasted energy to generate electrical power. Piezoelectric materials are good candidates for transforming mechanical energy into electrical energy. The starting point of this work was what if we can produce piezoelectric fibers and than manufacture fabrics from them. Here, we introduce the energy generation characteristic of a 3 dimensional (3-D) piezoelectric fabric, containing piezoelectric filaments, conductive yarns and insulative yarns. The fabric was produced by a 3-D knitting machine. Piezoelectric filaments were used as spacer yarn interconnecting or separating two knitted layers. In this presentation, we will give the information about piezoelectric filament production, 3-D all fiber piezoelectric fabric construction as well as the experimental results for voltage responses and current densities of 3-D spacer fabric under various applied loads. The results proved that the voltage output and current density of the piezoelectric fabric is proportional to the applied mechanical energy.

Keywords: Voltage Output, Current Density, Piezoelectric Fabric

INVESTIGATION OF A CHEMICAL MODIFICATION METHOD WHICH ENABLE POLYAMIDE/ELASTANE FABRICS TO BE DYED AT LOWER TEMPERATURES

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Abstract:

Within this study, dyeability of the polyamide/elastane fabrics, which are commonly used in textile industry, below the boiling temperature with 1:2 metal complex dyes without causing loss of efficiency was examined. For this aim, firstly studies on developing a cationizaton agent which can modify fibers chemically was investigated. Then its application process was determined with the aim of making possible to dye polyamide/elastane fabrics at low temperature (80°C). As a result of experiments, optimum conditions of cationization treatment were determined as pH 7, 60°C, 30 min. and a concentration of 5% for decreasing dyeing temperature to 80°C. Fabric samples treated at these conditions were dyed at 80°C and results were compared with the untreated sample dyed at 100°C. It was seen that it was possible to decrease dyeing temperature from 100°C to 80°C without a loss in color efficiency or decrease in fastness values if cationization treatment was done. All results were also proved by industrial scale experiments.

Keywords: Polyamide, Elastane, Dyeing, Cationization, Color Yield, Fastness

INVESTIGATION OF THE DYEABILITY OF COTTON KNITTED FABRICS WITH WITH VARIOUS DYE PLANTS IN THE PRESENCE OF POTASSIUM ALUMINUM SULFATE MORDANT

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Abstract:

As the certain chemical compounds present in synthetic dyes are carcinogenic, mutagenic and allergic, dyes obtained from natural sources are increasingly gaining importance in the textile dyeing field. In the content of this study, cotton fabrics were dyed in the presence of potassium aluminum sulfate mordant with 39 different dye plants. Then both color efficiency and fastness properties of dyed samples were evaluated. Dye plants that give both good color efficiency and sufficient fastness values were determined. According to the experimental results it can be said that for yellow pomegranate rind or turmeric; for green myrobalan; for yellowish brown onion hell; for reddish brown catechu give the best results.

Keywords: Cotton, Natural Dye, Mordant, Fastness, Color Yield

PROGRAMMING ENCRYPTION ALGORITHMS WITH STEGANOGRAPHY

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Abstract:

In this paper a different cryptographic method is introduced by using Power series transform, science of steganographi. Here,we produce a new algorithm for cryptology,we use Expanded Laplace transformation of the exponential function for encrypting the plain text and we use codes of ASCII for support to the confidentiality of the chipertext. After, Chipertext have embedded by steganographic method in another plaintext to hide the existence of chipertext. We show corresponding inverse of Power Series transform for decryption. Then; Experimental results were obtained by writing a computer program for crypto machines.

Keywords: Cryptology, Encryption, Decryption, Laplace Transform, Steganography, Programming For Encryption Algorithms.

MICROPROCESSOR CONTROLLED RESPIRATORY FUNCTION TEST SIMULATOR

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Abstract:

In this study, simulator design that everybody can use easily was performed for respiratory function test applied to people having shortness of breath, stertorous respiration, expectorating complaints, to people who smokes cigarette for a long time whether they have complaints or not, to people thinking illness that exists in another organ of the body affects lung, to athletes, to people to be given inhaler, relieving inflammation, and preservative medications because of their illness, and to people that effect of medications want to be investigated.

Among function tests; air volume entering and exiting to lungs during relaxation or exercise, maximum air amount (FEV1) to be exhaled in one second while lungs are full, and reversibility that are measurements test about whether velocity increases or not with expander medications (bronkodilators) by this simulator.

A PIC16F877 based design was performed for this. Analogue signals obtained with blowing flow meter flow sensor are translated to digital information by PIC. LED group consisting from 16 groups was designed as 5 levels. These 5 levels will become active in stages according to age groups or volume given by lungs during blowing, and it will assist to be informed of us.

Respiratory function tests can also be used to observe response to the treatment as well as they are subsidiary tests for diagnosis. As much as respiratory function tests assist diagnosing some diseases, especially asthma and COPD, they are important tests playing role on determining of severity of these diseases, and on evaluating response of the treatment. Not only these tests are used by chest diseases clinics, but also they are used to measure the effect of rheumatic, neurologic, hematologic diseases on lung functions, and to evaluate response to the treatment. It will be contributed to observe conditions of lungs by this designed device.

Keywords: Respiratory Function Test-Microprocessor Control-Simulator

GREEN SUPPLIER SELECTION: A REVIEW OF METHODOLOGIES AND CRITERIA

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Abstract:

Supplier selection, which is one of the key elements for building effective supply chains, has been a prominent topic for over sixty years. Supplier selection along with supplier evaluation have been studied comprehensively in both corporate and academic world. In recent years, companies tend to consider green policies due to the growing body of consciousness about environmental issues such as stakeholders' force to adopt environmentalist approaches, depletion of natural resources and environmental legislations set by governments. Therefore, in order to analyze and review the current literature on green supplier selection problem, this paper provides a systematic literature review on published researches between 2007 and 2016. The major goals of this paper are to determine the most widely used decision criteria in green supplier selection problem and methodologies implemented by the researchers to address the solution of the problem. By summarizing the literature, we present the literature gaps along with possible future research directions.

Keywords: Green Supplier Selection, Literature Review, Multi-Criteria Decision Making

PRODUCTION OF CP-TI REINFORCED A356 ALUMINUM COMPOSITE BY VACUUM-ASSISTED INVESTMENT CASTING

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Abstract:

This study aims to manufacture aluminum based metal-metal composite (MMC) reinforced with sawdusts which provide strengthening of matrix alloy in an environment-friendly way. Commercially pure titanium (CP-Ti) was used as a reinforcement and A356 aluminum alloy was chosen as a matrix material. CP-Ti sawdusts were compressed in an attempt to obtain porous monoblock preform which was infiltrated by A356 melt under vacuum atmosphere. Plaster mould investment casting technique was performed in order to keep cooling rate as low as possible. Casting operation was carried out at varied temperatures from 700 to 790°C. The effect of pouring temperature on interface bonding performance between CP-Ti and A356 alloy was investigated. Light optical microscopy and energy-dispersive X-ray spectroscopy (EDS) were conducted for microstructural analysis and characterization of interfacial region.

Keywords: Titanium, Aluminum, Composite, Investment Casting

A MATHEMATICAL PROGRAMMING MODEL FOR MULTI-OBJECTIVE OPTIMIZATION IN FLEXIBLE MANUFACTURING CELLS

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Abstract:

Flexible manufacturing systems have a chance of responding quickly to changing customer requests. Because the systems are developing technological and highly automated manufacturing systems. In this study, a mathematical programming model that considers a weighted approach to minimize the total inter cell and intra cell part movements, total machine-system workload unbalance, total labor-system workload unbalance, and the total number of tools on all machines in cells according to optimum alternative routes of parts, is developed. The proposed mathematical programming model is formulated as a mixed integer linear programming. First, an illustrative example problem and then related sensitivity analysis are performed to show how to carry out the proposed model using LINGO optimization software. In this study, the objective function elements that mentioned above are optimized according to the optimal alternative routings selected for all parts due to the proposed mathematical model.

*: This study is from currently continuing MSc. Thesis.

Keywords: Flexible Manufacturing Systems, Mathematical Programming Model, Alternative Routing Flexibility.

THE EFFECT OF DIFFERENT AFTERTREATMENTS ON COLORATION OF WOOL FABRICS WITH HAZELNUT SHELLS

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Abstract:

Dyeing of textile materials with natural sources is a well-known process and it has used since pre-historic times. Today natural dyeing has started to attract attention because it is believed that natural dye sources are less harmful to humans and environment. In natural dyeing different natural sources like herbal sources can be used. In this study hazelnut shells were used for the coloration of the wool fabrics. By this way it was planned to show the usability of a herbal waste in a dyeing process. The dyeing processes were conducted with different mordanting agents and also not mordanted but dyed samples were evaluated too. After dyeing, different chemical processes containing hydrogen peroxide, sodium dithionite, sodium carbonate or tartaric acid were managed. Then the dyed samples were analyzed in terms of CIE L*a*b* color values, color changes and color efficiencies. It was observed that hazelnut shells can be used for the coloration of the wool fabrics and depending on the mordanting agent and aftertreatments different colors can be observed.

Keywords: Hazelnut Shell, Mordant, Natural Dye, Aftertreatment, Wool

USE OF GREEN TEA IN DYEING OF CELLULOSIC FIBERS

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Abstract:

The colors of the textile goods can be important for the sales appeal. So it can be told that textile finishing especially dyeing-printing processes have a great role in steering the customers. Today for the coloration of textile goods generally synthetic dyes are used. However in this study it was aimed to introduce the usability of green tea in coloration of cotton and linen fabrics as a natural dye source. Green tea has been used directly in dyeing of the fabrics, in other words green tea has not been taken to an extraction period previously. So dye extraction and dyeing has been managed at the same time during the dyeing step at boiling temperature. In dyeing period simultaneously mordanting has been managed by the use of different mordants such as CuSO4.5H2O, FeSO4.7H2O, K2Cr2O7, SnCl2.2H2O, KAl(SO4)2.12H2O. Additionally, the dyeings without use of any mordant has been conducted too. The dyed fabrics were then analyzed in terms of color efficiencies (K/S) and color values (CIE L*a*b*). Moreover the fastnesses of the dyed samples were examined too. Finally it was found that green tea can be used for the coloration of both linen and cotton fabrics.

Keywords: Cotton, Linen, Natural Dye, Green Tea

ANT COLONY OPTIMIZATION FOR PORTFOLIO OPTIMIZATION

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Abstract:

In this paper, we focus on solving mean-variance portfolio optimization with cardinality constraints. This multi-objective problem has two conflicting objectives: profit maximization and risk minimization. Therefore, an efficient frontier that presents a tradeoff between the two objectives is sought. Cardinality constraints that impose a restriction on the number of assets to be held and lower-upper limits for the proportion of each asset bring the problem to the class of NP-Complete problems. In general, metaheuristic algorithms may conveniently provide near optimal solutions for the problems in this class. A popular algorithm, ant colony optimization that was firstly introduced for solving travelling salesman problem, has widely been adapted to solve various discrete optimization problems in the literature. However, there are not many applications on continuous domains. Portfolio optimization requires a search in the continuous search space and therefore in this study, a continuous variant of ant colony optimization technique is adapted. The method was tested on five well-known publicly available benchmark problems along with two new data sets from a developing country that intends to further extend the publicly available benchmark data sets to the attention of researchers. Initial results are promising to enable the design of an efficient algorithm for both practitioners and researchers.

Keywords: Ant Colony Optimization, Portfolio Optimization, Mean-Variance Model

VARIABLE NEIGHBORHOOD SEARCH FOR PORTFOLIO OPTIMIZATION

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Abstract:

Portfolio optimization involves a multi-objective problem with two conflicting objectives: profit maximization and risk minimization. If a portfolio cannot provide a better profit for a given risk value or cannot provide a lower risk for a desired return level, then that portfolio is accepted to be on the efficient frontier that is determined with a set of pareto optimal solutions. In this paper, we present a continuous variant of variable neighborhood search (VNS) approach, for solving the cardinality constrained mean-variance portfolio model that provides a practical investment strategy for rational investors. In order to overcome continuous domain difficulties, five local search neighborhood structures that include procedures utilizing derivative information: Steepest-Descent method, Fletcher-Reeves method, Davidon-Fletcher-Powell method and procedures utilizing non-derivative information: Hooke-Jeeves method, Nelder-Mead method are integrated to VNS. The proposed solution approach is tested on seven different capital market indices; namely, Hang Seng, DAX 100, FTSE 100, S&P 100, Nikkei 225, XU030 and XU100 using popular performance measures defined in the literature in order to calculate the errors between heuristic frontier and the standard efficient frontier. The proposed approach has promising insights and by developing strong local search operators designed for continuous domain, the algorithm may be enhanced for providing a superior solution methodology.

Keywords: Portfolio Optimization, Variable Neighborhood Search, Mean-Variance

PLAY STREET: THE FUTURE OF RESIDENTIAL STREETS

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Abstract:

Roaming freely and playing on the street and at the doorstep of the house, have a remarkable place in today's adults' childhood memories. Streets are vital for cities and for children's development, with the variety of playing opportunities and irreplacible gradual experience of urban environment. Unfortunately, today's children are detached from the street, due to adult's fear of crime, security, allienaiton and dominance of traffic. This situation creates inactive children under the threat of immune system deseases, obesity and lack of social skills.

Many parents in cities prefer to live in gated communities, at least to meet the outdoor space necessity. This situation decreases the life-span pediod of the houses in urban areas and damages the sense of belonging and urban sustainability.

In Turkey, as in many parts of the World, local authorities who are aware of child's right to play, define streets under the name of "Child's Street" or "Play Street" in order to encourage children to play out. Even under different child oriented local management movements, this street type takes posession over "standard" streets. "Play Street"s are rapidly spreading and has many impacts on residential community and urban environment.

This study defines and compares street play environments, describing variety of types, including temporary traffic closure, permanent street arrangements, housing design impacts and urban design at neighborhood scale within the context of space for children's play.

As a conclusion, the benefits of streets where children can safely spend time and learn to live together with all age groups and all parts of the community as a micro-urban experience are stated together with the challenges to reach the "ideal" play street and its probable negative and positive effects on the urban environment.

Keywords: Social Innovation, Play Street, Inclusion, Children's Environment, Urban Space

URBAN GREEN SPACES IN THE CONTEXT OF CHANGE AND INTERACTION

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Abstract:

Public green spaces have a very critical place within social life, in terms of the functions they have in environment-human and individual-society interaction. Today, the community is becoming less and less connected with public green spaces, mostly due to small-scale designs that have been carried out without a holistic perspective. Achieving the efficient use of these areas depends on moving beyond the stereotypes and acting with the awareness that the interaction between the individual and environment is one of the basic needs of society.

Especially in developing countries, there are unqualified and unhealthy green areas allocated to the public use. Scattered unplanned and undersized green spaces and parks are not able to represent a powerful meaning for its environment in terms of their use and this leads to inefficient use of the areas in question. Public green spaces can be recovered by first determining the reasons of them being idle and then rehabilitating these areas. In the paper, best-practice examples of rehabilitation are given and discussed. In order to carry out the recovery process of the various scaled green spaces with certain order and level in a healthy manner, it is necessary to establish a frame in which the public spaces can be assessed within the context of change, use and interaction in today's conditions. In the paper; the factors affecting the use of the green areas positively and/or negatively are determined and then the effects of rehabilitation applications through ''AlaCatı Yel DeGirmenleri Parkı'' are evaluated in line with these criteria, with the aim to contribute to the rehabilitation of the public green areas.

Keywords: Design For Interaction, Public Green Spaces, Rehabilitation, Alacatı

EFFECT OF AUSTENITISATION TEMPERATURE ON MICROSTRUCTURE AND MECHANICAL PROPERTIES OF 38MNVS6 MICROALLOYED STEEL

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Abstract:

The effect of austenitisation temperatures on the final microstructure and mechanical properties of a microalloyed medium C steel was investigated. The microstructure was characterized by optical microscopy; the mechanical behavior was studied by hardness, tensile and instrumented Charpy V-notch impact tests carried out at room temperatures. Continuous cooling transformation (CCT) diagram has been calculated with the aid of by JMATPro which is a commercial software package which is based on CalPhaD and extended by various models which allow calculation of materials properties. The experimental and numerical studies showed that austenitisation temperatures had important effect on impact energy due to ferrite/pearlite fractions.

Keywords: Microalloyed Steel, Jmatpro Simulation, CCT Diagram, Austenitization Temperatures

MICROSTRUCTURAL ASPECTS OF NICKEL-BASED SURFACING DEPOSITED BY GAS METAL ARC WELDING (GMAW)

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Abstract:

Nickel-based alloy coating was deposited on AISI 1.2714 tool steel substrate using by gas metal arc welding (GMAW). The deposit was characterized by hardness measurements, microstructural examination and EDS / XRD analyses. It was investigated the influence of mixing the base metal and a filler metal and the influence of microstructural evoluation. There were no cracks or other defects observed in the hardfacing coating. The microstructure of the hardfacing deposit predominantly consisted of the γ-Ni phase and the interdendritic eutectic mixture. These studies also revealed the presence of niobium-rich carbides. Hardness testing revealed that the average hardness of the hardfacing was lower than that of substrate.

Keywords: Hardfacing, Ni-Based Alloy, Microhardness, Microstructure

START UP OF ANAMMOX REACTOR AND SHORT TERM EFFECTS OF TIO2 NANOPARTICLES ON ANAMMOX BACTERIA

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Abstract:

Biological nitrogen removal is widely accomplished by conventional nitrification and denitrification processes in wastewater treatment systems. Conventional nitrification and denitrification processes lead to high operation cost due to oxygen requirement and external carbon addition. Even if this process is successful, there is some serious difficulties during wastewater treatment, especially industrial wastewater treatment. In recent years, anammox (anaerobic ammonium oxidation) has been discovered as a new approach for ammonium removal. In this process, ammonium is used as electron donor and nitrite is used as electron acceptor and mainly nitrogen gas and some nitrate are produced. These systems produce less sludge compared to conventional nitrification and denitrification processes, consume less oxygen and do not require external carbon addition.

Nowadays, metallic and metal oxide nanoparticles are being used at medical and electrical industries, personal care products. Eventually, these nanoparticles are discharged to domestic wastewater treatment plants. In literature, there is no study which investigates the nanoparticle inhibition on Anammox systems.

The first objective of this study is to investigate the inhibitory effects of TiO2 on enriched Anammox culture. In this context, short and long term inhibition levels of titanium dioxide (TiO2) will be determined in both batch and continuous systems. The second objective of the study is the recovery of anammox process by TiO2 nanoparticle inhibition. Both batch and continuous experiments has been performed during the study. Firstly, 0-10 mg/L TiO2 nanoparticle concentrations used according to literature information. Concentration of TiO2 nanoparticle increased step by step if there is no inhibition in the system. After the inhibition experiments, anammox bacteria subjected to recovery tests which consist of EDTA washing procedure. Anammox bacteria centrifuged and then they shaken with EDTA washing solution to get rid of the TiO2 nanoparticles from the bacteria.

Keywords: Anammox, Tio2, Inhibition, Nitrogen Removal

GREEN AND SUSTAINABLE APPROACH FOR DESIGN OF ANTIBACTERIAL WOUND CARE DRESSINGS

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Abstract:

One of the most important challenges for antibacterial wound care dressings is their production methods and adverse effects of toxicants on human and living organisms while using and disposing them. Wound dressing with a global market size of 13 billion dollars in 2008, is one of the most developed areas in medicine sector. Approximately 200,000 burn incidents are happening in Turkey every year, of which one of the thousandth is mortal. In addition, increasing earth population and the environmental pollution, much focus has been placed in the recent years to find new health and hygiene related products with the minimum adverse effect on the environment. To address these growing concerns for the mankind and the environment, the development of new antibacterial wound care agents has become one of the most important research areas to combat some pathogens. Assessing the risks associated with the use of synthetic and metal-based antimicrobial agents in commercial products requires a detailed understanding of the materials mobility, biocompatibility, and biodegradability in a physiological environment. Unfortunately, there is not enough research to observe the adverse effects of these active agents and also what they produced, used and released or left to the environment in an unconscious manner in the most of the time. The additive toxicity also becomes an important issue when the compound is actually released to the environment.

Here, we focus on the use of domestic medicinal plants extraction which are cultivated in Turkey, as an effective antibacterial agent for the purpose of open wound treatment by incorporating with nanofibers. We further investigated the performance and morphology of the nanofiber webs as well as characterized their structural properties.

Keywords: Antibacterial, Wound Care, Plant Extract, Nanofiber, Eco-Friendly

CLOSED LOOP LASER DIODE TEMPERATURE CONTROL SYSTEM DESIGN

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Abstract:

In cancer treatments, because of being a minimally invasive method and having no significant harmful side effect to the patient. This method begins with the administration of ALA-5 photosensitizer material prior to treatment in the tissue, which reacts chemically to the specific wavelength light. Dosimetry calculations determine the time required for ALA-5 in the body to remain only in the tumor. At the end of this period, the tumor tissue becomes eligible for targeted treatment. In order to be able to create the thermal effect on the tissue with the laser beam, a laser with a constant wavelength must be used. When ALA-5 provides sufficient energy in the target tissue exited with specific wavelength light energy in the cell, the cancer cells lead to necrosis. In order to complete the treatment successfully, Photodynamic therapy system's laser diode must have a constant temperature and constant output power so that it can generate constant wavelengths. Since the laser diode temperature is directly related to the wavelength and the output power, control of the temperature at a single point is an essential issue.

In the study, the selected laser diode need to be stabilized at a temperature of 15 °C so that it could operate steadily at a wavelength of 635 nm which can excite the ALA-5. The thermoelectric controller (TEC), the thermistor directly connected to the laser diode, detects the temperature of the diode. The sensed temperature value is applied to the (Dspic30f4013) microcontroller's ADC circuit via an analog circuit that will produce 5V for the maximum value and 0V for the minimum value of the thermistor. This feedback from the thermistor with PID control on the microprocessor determines the PWM on and off time ratio. Cooling control is provided instantaneously by PWM signal applied on the thermoelectric material.

Keywords: Phtodynamic Therapy,Laser Diode Temperature Control, Closed Loop,

COMPARISON OF NATO BULLETS AND 6.8 MM REMINGTON

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Abstract:

In this study, it is aimed to compare the Nato ammunition at medium and heavy level and to observe the field and technical analysis of Remington ammunition as a Nato ammunition. Modeling of the ammunitions used in the project was done with the help of Solidworks Packet Program and static and dynamic analysis with Autodesk Inventor program. After the modeling was done, the method to be used for the field was determined and the materials required for the test were selected and provided. After these operations, the test phase was passed. AW ACCURACY - MC MILAN - KANNAS - G-3 weapons and steel hood, steel vest, compacted snow, soil, wood, mud, dry pine and steel plate. Thus, the drilling powers of ammunition have been tested and observed.

Keywords: Weapons, Ammunition, Nato, Solidworks, Autodesk Inventor

CONTROLLING THE BUILDING MODEL USING HIGH ORDER SLIDING MODE CONTROL OPTIMIZED BY MULTI OBJECTIVE GENETIC ALGORITHM

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Abstract:

High Order Sliding mode control (HOSMC) has been used in many mechanical systems and structural system due to its accuracy, chattering attenuate and high control performance. How-ever, choosing controller parameters for systems is still an important research area. This study presents a numerical analysis to decrease the effect of earthquake vibrations on build-ing model having Active Tuned Mass Damper (ATMD). The system is excited by an earthquake and a linear motor is used as the control device. ATMD is installed on top floor of building model. Tuning of High Order Sliding Mode Controller (SMC) using Super Twisting Algortihm with Multi Objective Genetic Algorithm (MOGA) is designed for a three storey building model with ATMD. HOSMC parameters have been chosen by MOGA with multiple objective functions. Then, simulation results of uncontrolled and controlled model are compared. The results show that building model with HOSMC tuned by MOGA is effective to decrease the effects of vibrations.

Keywords: High Order Sliding Mode Controller, Multi-Objective Genetic Algorithm, Building Model, Active Tuned Mass Damper, Simulation.

GENETIC ALGORITHM-OPTIMIZED PID CONTROL OF A PENDULUM

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Abstract:

In this study a Proportional-Integral-Derivative (PID) controller is designed for the pendulum system. PID controller is preferred because it is widely used in industry. On the other hand it is not easy to tune its gains especially for the nonlinear systems. Therefore the gains of the PID controller are obtained by a genetic algorithm optimization procedure in this study. Then the performance of the controller is verified via simulations. The designed controller is also compared with the classical PID controller. The numerical results indicate that the performance of the genetic algorithm-optimized PID controller in terms of maximum overshoot and settling time reduction is better than the classical PID controller.

Keywords:PID Controller, Genetic Algorithm Optimization, Pendulum, Simulation

MICROWAVE ENERGY FIXATION FOR DISCHARGE PRINTING ON COTTON FABRIC

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Abstract:

Discharge printing is a printing method based on dye stripping from the previously dyed fabric at desired areas. It is widely used for furnishing and apparel textiles. In this study, the usage of microwave energy for fixation of discharge printing paste on cotton fabric was investigated in comparison to conventional steam fixation. Reactive dyed cotton samples were printed with neutral discharge printing paste and fixed with both conventional steam process (at 102oC for 10 minutes) and microwave energy (for 1, 3 and 5 minutes at 720 and 900 Watt). Afterwards, color strength (K/S) properties of printed fabrics have been evaluated. It was observed that microwave fixations resulted in quite similar discharging effects with classical steam fixation. In other words, microwave energy could be used in fixation process of discharge printing on cotton fabrics.

Keywords: Discharge Printing, Steam, Microwave, Fixation, Color, Printing, Cotton

POTASSIUM PERMANGANATE BLEACHING OF NATURAL PINEAPPLE FIBERS

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Abstract:

Pineapple fiber is a kind of lingo-cellulosic fiber extracted from pineapple plant leaves. Pineapple fiber is abundant in the tropical or subtropical countries due to weather conditions. Pineapple fibers can also be categorized as agro waste fibers. In this paper, the usage of potassium permanganate as a bleaching agent for pineapple fabrics has been investigated. Pineapple fabrics were bleached with potassium permanganate in various conditions (at pH 4 and pH 7; 60 and 90oC; 10 minutes with 1, 3, 5, 7, 10, 20 g/l potassium permanganate concentrations) and then treated with oxalic acid in various concentrations (8, 16, 24 g/l). Bleached pineapple fabrics were evaluated according to their whiteness and yellowness indexes and lightness (L*) properties. Whiteness index of pineapple fabrics increased with an increase in applied potassium permanganate concentration up to 7 g/l, however; higher concentrations resulted in a decrease in whiteness values. The best whiteness and yellowness indexes were observed on pineapple fabrics treated with 7 g/l potassium permanganate at 90oC and pH 7 and followed by 8 g/l oxalic acid treatment.

Keywords: Natural Fiber, Pineapple Fiber, Lignocellulosic Fiber, Agro Waste Fiber, Bleaching, Pretreatment, Potassium Permanganate

AN EFFECTIVE MODELLING METHOD BASED ON MLP-BASED ARTIFICIAL NEURAL NETWORKS FOR OBTAINING V-CURVE CHARACTERISTICS OF SYNCHRONOUS MOTOR

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Abstract:

System models are created based on the data obtained from applications or mathematical expressions. Modelling plays a vital role in the determination of dynamic behaviors in a system. Artificial neural networks have been widely used in the modelling of complex and non-linear systems. Various studies have focused on the use of artificial neural networks for system identification and modelling. Multilayered artificial neural networks with a feed-forward and non-linear structure are often used in various applications such as image recognition, classification, system modelling, function approximation, and the estimation of chaotic time series. Multilayered artificial neural networks is the most commonly used type of artificial neural networks in the solution of non-linear problems. Synchronous motor is an alternative current motor in which rotor rotational speed is equal to the rotational speed of the stator rotating field and the rotation speed does not vary in loading. When excitation current of the synchronous motor changes, it absorbs ohmic, inductive and capacitive current from the grid. In a synchronous motor operating at a constant load and voltage, the characteristic which yields the relationship between excitation current and stator current is called V-current. This study proposes an effective modelling method via multilayered artificial neural networks by obtaining excitation current and current load data comprising V-curve characteristics of the synchronous motor in Matlab/Simulink. The proposed modelling method can be applied to all characteristics of the synchronous motor.

Keywords: Modeling, Synchronous Motor, Artificial Neural Network

NOISE REDUCTION OF EMG SIGNALS USING WAVELET TRANSFORM

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Abstract:

Electromyography (EMG) is a technique for evaluating and recording the small electrical signals produced by skeletal muscles. An electromyograph detects the small electric potentials created by muscle cells, when these cells are neurologically activated. The signals can be used to detect abnormalities, activation level in muscles. EMG signals can be contaminated during measurement because of broken cables, weak cable connections, quality of electrodes, fluorescents in the measuring room. It is necessary to amplify EMG signals because of their small voltage range .Thats why amplification is a main part of EMG signals to understand and diagnose. It is quite important to filter signals effectively before amplification otherwise any noise can be amplify with the pure signals during amplification and affect negatively accuracy of measurement. The main purpose of this paper is to make it cleaner contaminated EMG signals using wavelet transform to provide efficient and effective ways of understanding of signal and its nature. In this study, arm muscle F12 Extensor Digitorum communis has been measured with a needle EMG method in a hospital with patient's permission and denoised with filters. Wavelet Transform Methods are used to design a filter. Signal To Noise Ratio is a method for evaluating performance of filter by comparing their uncontaminated values. Contaminated signals and filtered signals are exhibited together to point out the difference. Performance of filter is measured using Filter To Noise Ratio (SNR) method. In conclusion, filter works efficiently and signal is uncontaminated according to SNR results.

Keywords: Wavelet Transform, EMG Signals, Signal To Noise Ratio (SNR)

ECOLOGICAL APPROACHES IN TEXTILE SECTOR: THE EFFECT OF R-PET BLEND RATIO ON RING SPUN YARN TENACITY

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Abstract:

Nowadays, climate change has serious problem for all over the world. To overcome this problem some attempts have been performed by governments to minimize waste generation. Polyethylene terephthalate (PET) bottles are produced from raw petrochemical products and waste after use has not affect environment directly. On the other hand, the increasing volume of PET bottle waste causes economical and environmental problems unless to be recycled. Recycling of PET bottles leads to decrease waste problem and use of raw petrochemical products and energy. In addition, this process does not reducing cost but it is essential to conserve ecological balance. PET bottles can be easily separated from other wastes, some additional processes are needed ie. breaking, washing, drying to obtain PET flakes. r-PET fibers to be used in textile industry are produced by melt spinning system from PET flakes. This recycled product can easily be adapted to textile product production instead of virgin PET. This study aims to determine the effect of using r-PET fiber with different blend ratio on ring spun yarn tenacity and elongation. At this respect, r-PET fiber was blended with cotton fiber at 100%, 70/30%, 50/50%, 30/70% and 0% ratios. Yarn samples were manufactured by ring spinning system and all production parameters were kept constant to evaluate the effect of blend ratio variable. It was determined that r-PET fiber ratio has significance effect on tenacity and elongation.

Keywords: R-PET, Recycling, Ring Spinning, Tenacity, Elongation

THE IMPORTANCE OF SYSTEM SIMULATION SOFTWARES AT INDUSTRIAL ENGINEERING EDUCATION: A CASE STUDY FROM TURKEY

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Abstract:

Simulation is the general name of the methods and applications used to imitate real systems. System simulation is mathematical modeling of real systems. System simulation is one of the most preferred method by the private sector and one of the most important methods of industrial engineering. It is usually done using computer and special simulation software.

The purpose of this study is to investigate the content of system simulation undergraduate courses in industrial engineering departments as well as the share of the simulation software in the undergraduate education and the given importance. For this purpose, all private universities that has industrial engineering department in Istanbul the city with the most universities in Turkey, were selected. The detected 27 universities were sent an email to heads of industrial engineering departments to ask questions about the contents of their system simulation undergraduate courses. The given answers were examined and, when it is necessary, discussed with other academicians via email. By examining the correspondences, the content of the system simulation training of each university is categorized by the theoretical, software, application, and software name dimensions.

Only 9 universities were able to provide the requested information. 4 of these 9 universities' industrial engineering departments are mainly teaching simulation software. The rest make up theoretical lecture on weight. However, in all of them, a system simulation software is mentioned. The simulation software described and used in the lessons are the Arena at six of them, Simio at two and Promodel at one of them.

As a result, it is seen that training of system simulation software is an important part of the undergraduate education of industrial engineering departments at the private universities in Istanbul. In the further studies, the research population will be extended throughout Turkey.

Keywords: Simulation Software, Industrial Engineering, System Simulation, Undergraduate

COMPRESSION PROPERTIES OF WOVEN CARPET PERFORMANCE UNDER DYNAMIC LOADING

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Abstract:

Carpet is predominantly used in home floor covering as an indispensable decorative product and also preferred by its heat and sound insulation feature. Compression performance in general terms of mechanical properties influences carpet performance based on usage are dynamic or static loads. Thickness loss of carpet is affected negatively under dynamic and static load which are created by walking and furniture, respectively. During use of carpet thickness loss is directly affected by raw material, pile thickness, carpet construction, pile density. There are a lot of studies focused on effects of these parameters on carpet performance. In this study, the influences of pile thickness and pile density on woven carpet compression performance under dynamic loading are investigated. Woven carpet samples were produced as Wilton face-to-face with two different pile density as 2400 piles/dm2 and 2880 piles/dm2 and three different pile thickness as 7 mm, 11 mm and 16 mm. Raw material of pile was selected as acrylic fiber with 5.6 denier linear density. All carpet production parameters were kept constant such as machine speed, weft and warp yarns used, construction. Dynamic loading tests were achieved by WIRA dynamic loading machine. Thickness of carpet samples were measured after 50,100,200 and 1000 impacts. Test results were analyzed to determine the significance effect of pile density and pile thickness on thickness loss of carpet performance by SPSS package program. Statistical analysis showed that the pile density and pile thickness have a significant effect on thickness loss of carpet samples.

Keywords: dynamic loading, woven carpet, face-to-face, acrylic

DETERMINING THE EFFECT OF HARDENING TYPE ON CYCLIC PLASTICITY MODELING USING FINITE ELEMENT ANALYSIS

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Abstract:

Determining fatigue life of a material has an importance from industrial and academic perspectives. Calculations of stress and strain values must be accurate to perform a sensitive fatigue life analysis of a material. However, there are numerous plasticity models to determine cyclic behavior. Selection of a plasticity model has an important role on sensitivity of fatigue life estimations in finite element analysis. Generally, isotropic and kinematic hardening models are used as plasticity models. Determination of kinematic hardening parameters is a crucial and time consuming process.

In this study, displacement, stress and strains on a supported beam structure under dynamic loading will be determined by finite element analysis using different plasticity models. Isotropic and kinematic hardening models will be used in cyclic plasticity modelling. von-Mises and Chaboche material models will be investigated as isotropic and kinematic hardening models respectively. Chaboche parameters will be identified using Hollomon equation. Besides, results will be compared with two different commercial finite element analysis software.

Keywords: Cyclic Plasticity, Finite Element Analysis, Isotropic Hardening, Kinematic Hardening

DESIGN OF IPM SYNCHRONOUS MOTOR FOR GEARLESS ELEVATOR APPLICATIONS

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Abstract:

Interior permanent magnet synchronous motors (IPMSM) have been commonly used to meet challenging demands of high performance industrial applications. IPMSM have several advantages such as elimination of rotor copper loss, high power density and efficiency, high starting torque. In this paper, the design of IPMSM for gearless elevator has been investigated. Gearless elevator systems driven by PMSM have many advantages compared to traditional asynchronous motor applications. Due to highly sensitive absolute encoder coupled to motor and closed-loop driver system providing sensitive control, PMSM based gearless elevators show high performance at lifting up, stopping and moving. However, drawbacks of IPM machines are high torque ripple and rising cost of rare-earth permanent magnets such as NdFeB and SmCo. The variation of magnetic reluctance between the flux barriers and teeth causes the torque ripple. In this study, different slot/pole combinations and number of flux-barrier layer have been investigated to reduce torque ripple. Furthermore whole design is based on ferrite magnet which is cheaper and more common. MotorSolve BLDC Finite Element Analysis based software has been used. Eventually attributes such as low cost, high efficiency, high torque density and lowest possible torque ripple have been achieved for the design of IPMSM in gearless elevator applications.

Keywords: : Interior Permanent Magnet (IPM), Machine Design, Gearless Elevator Application, Torque Ripple, Ferrite Magnet.

MESENCHYMAL STEM CELL RELEASED FROM CYTOKINES AND CHEMOKINES, ITS EFFECT ON COLON PRIMER, METASTATIC ADENOCARCINOMA AND CANCER STEM CELLS

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Abstract:

Cancer is a group of diseases involving abnormal cell growth with the potential to invade or spread to other parts of the body. The gastrointestinal cancer is a frequently met malign tumor oriented case and its cure is still uncertain. Cancer stem cells (CSCs) are cells that drive tumorigenesis, as well as give rise to a large population of differentiated progeny that make up the bulk of the tumor.

In this study, the human metastatic colon carcinoma cell line (Colo 741), human primary colon cancer cell line (HCT 116) and Human mesenchymal stem cell string of bone marrow PCS-500-012 were cultured in DMEM containing 10% FCS, 1% L-glutamine and 1% penicilin-streptomycine. Colon carcinoma stem cells were isolated from both types of cells by magnetic-activated cell sorting (MACS) technique and characterized by CD133 surface protein using immunohistochemical analyses. Primary and metastatic colon carcinoma cell line and cancer stem cells obtained from from both types of cells was sprinkled to the bottom of 24 partitioned- culture cups and mesenchymal stem cell line of bone marrow was expected to cling to the cup then, was added to the upper parts of the cups and their cultures was one by one prepared. On the 7. and 14. days of the culture CXCL1, IL-6, IL8 and CCL2 values was examined in supernatant by ELISA, on the 14. day IL-6, IL-8, CXCL1, CCL2 was examined with an immunohistochemical method.

The results indicated that Colo 741, HCT116 and the cancer stem cells separated from them cocultured with human mesenchymal stem cell secreted an increased level of cytokines and chemokines after 14 days. The inflammatory mediators released by mesenchymal stem cells related to the micro-environmental factors survival of the colon cancer cells. Mesenchymal stem cells start a reaction with the new micro-environment and they secrete different mediators.

Keywords: Stem Cells, Cytokine, Chemokine, Cancer

COMPARISON OF ANALYTICAL AND NUMERICAL CALCULATIONS OF A COLD ROLLING PROCESS

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Abstract:

Cold rolling process increases the strength by strain hardening and holds tighter tolerances. Typical products for cold-rolled materials includes motorcycle exhaust pipes, computer cabinets, hinges, metal containers, fan blades, etc. Cold rolling processes needs more force application then hot rolling so determining rolling force or material strain becomes important. Today, finite element analysis have a wide usage area to determine process parameters.

In this study, rolling process of 7516 IF steel will be investigated by means of rolling force and strain rate via analytical and numerical calculations. As a first step cold rolling process of IF material will be performed and 4 mm initial thickness will be reduced to 0.8 mm, and process values will be recorded during the experiment. Then, rolling force and strain rate values will be calculated by analytical methods. Tselikov and Sims Methods will be used to determine rolling force and strain rate, respectively. Numerical calculations will be performed by finite element analysis. As a result, analytical and numerical calculations will be compared with experimental results.

Keywords: Cold Rolling, Finite Element Analysis, IF Steels

COMPARISON OF DIORAMAS AND 2D RENDERINGS AS DESIGN EXPRESSION TOOLS

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Abstract:

The concept of space can be defined as the part of space in which the space and boundaries that distinguish the basic state at a certain scale that surrounds the human being and are suitable for its actions are perceived by the observer and wrap around the existence of the subject. Throughout the history of humanity, space production has been needed as a result of basic needs like accommodation and protection. The design discipline has emerged due to the designing, producing and, accordingly, the concern of generating space. In this context, space production, which meets the needs of the period within the conditions that existed throughout history, constituted the most fundamental concern of the discipline of architecture.

The spaces that are supposed to be produced need to be expressed. Throughout history, ideas for design have been expressed in various means and methods. Design products can exist and be understood in terms of they can be expressed. When the design expression tools are evaluated in the historical process, it seems that they are constantly changing and transforming within technical and technological developments.

In this study, dioramas and 2D renderings were examined as architectural representation tools. Dioramas and 2D renderings have been compared and the strengths and weaknesses of expressing spaces have been examined. The purpose of the study is to express the contribution of the design expression tools examined in the scope of the study to the different phases of the process and the usability of the representation and expression in the design process.

Keywords: Dioramas, 2D Renderings, Architectural Space, Architectural Expression Tools

DESIGN OF A MICROCOMPUTER BASED REALTIME ECG HOLTER DEVICE

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Abstract:

The main objective of the project is to develop an open source embedded system based ECG Holter device. Due to the limited opportunities and challenges of hospitals, patients are having difficulties for continuous monitoring which is highly vital for the patients. Thereby, portable, easy to use, and mobile devices must be designed for the medical specialists, cardiologists, patients, and engineers that who are willing to contribute developing the system. The project consists of three main parts; a bioinstrumentation amplifier which is responsible for Biosignal detection, an analog filter part and a microcomputer, respectively. At first stage, ECG signals were amplified by a three opamp bioinstrumentation amplifier about 500 times. At the second stage, an analog 50 Hz notch and bandpass filter which has 0.1 and 120 Hz cutoff frequencies were used. Before using the microcomputer, the filtered ECG signals were recorded by an USB data acquisition card for control data. After this stage, and analog-digital converter was controlled by the microcomputer and the digitized data was obtained. The raw data was filtered on the second stage digital fir filter to reduce signal noise as real time. The filtered signal was plotted on a 7-inch touch screen in near real time and recorded to an SD card on the microcomputer. In this project, the algorithm was performed on three different microcomputers and their performances were compared. At first, the sampling rate for ECG analysis was achieved only about 35 Hz of the Beaglebone microcomputer which was not useful for ECG signals. Secondly, the sampling rate of the Raspberry Pi 2 could be about 80 Hz which might only be used for R-R interval detection. Lastly, Odroid microcomputers could achieve about 250 Hz sampling rate which could be shown an important candidate for real-time ECG analyses as holter devices.

Keywords: Ecg, Holter, Biomedical Instrumentation, Open Source,Embedded System

THERAPEUTIC EFFICACY OF HONEY LOADED SCAFFOLDS IN FULL-THICKNESS WOUNDS OF RATS

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Abstract:

The aim of this study was to evaluate the therapeutic efficacy of honey loaded silk fibroin matrices (SFM) on full-thickness cutaneous wound healing of rats. SFM were fabricated by wet electrospinnning of silk fibroin of Bombyx mori origin and poly(ethylene oxide) aqueous solutions, then treated with ethanol (SFM-E) to increase their stability, and eventually loaded with diluted honey (SFM-HE). The scaffolds had desirable porous and 3D nanofibrous structure for skin tissue engineering. Full-thickness skin wounds in a rat model were treated with scaffolds or left untreated (untreated control: UTC). Wound closure of SFM-HE (69 ± 7%) was found to be significantly higher than that of UTC (45 ± 12%) on post-operative 14th day. In biomechanical evaluations, SFM-HE groups were shown to restore only 44% of the tensile strength and 29% of tensile modulus of original unwounded skin of rats, forming the softest, weakest and the most extensible skin. Honey loaded scaffolds had significantly higher re-epithelialization, neovascularization and granulation than UTC according to histopathological scoring. Inflammation level of SFM-HE were also lower than UTC, but the results were not statistically significant. In brief, the utilization of honey as an adequate medication in skin tissue scaffolds might hold a great promise in the future.

Keywords: Silk Fibroin, Honey, Wet Electrospinning, Full-Thickness Rat Skin Wound

ACTIVITY AND STABILITY OF TIO2 CATALYSTS IN CATALYTIC DECOMPOSITION OF FORMALDEHYDE IN SUPERCRITICAL WATER

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Abstract:

Heterogeneous catalytic reaction in the presence of supercritical water (SCW) provides various advantages such as controlling of reaction rate, improvement of activity, stability and lifetime of the catalysts. However, the stability and mechanical strength of catalysts cannot be remained in SCW and these are generally the solid- solid transformations of the conventional catalysts. In addition, the structural changing such as the aggregation of solid catalysts, phase transformation and dissolution of solid can be occurred in SCW. The degree of the structural changing depends on the composition and preparation method of catalysts and operation conditions in the reactor. In this study, a series of TiO2 has been prepared by sol-gel method using different calcination temperatures in order to determine stability and catalytic activity decomposition of formaldehyde in SCW. The catalysts were characterized by surface area (Brunauer-Emmett-Teller, BET method), TGA, FTIR, SEM and SEM/TEM-EDS, XRD, zeta potential, Temperature-Programmed Reduction (TPR) and Temperature-Programmed Oxidation (TPO) experiments. The reactions were carried out in a batch reactor (Parr 4591) (inner volume of 100 cm3). 50 g of formaldehyde solutions and 0.5 g of the catalyst were loaded in the reactor. After 30 min at 400 oC, gas and liquid samples were analyzed by using an on-line GC and HPLC. Although anatase phase of TiO2 mostly formed until 600oC of calcination temperature, above this temperature, rutile phase formed. The characterization results show that an increase of calcination temperature from 350 oC to 900 oC decreases surface area of the sample and increases crystallinity and stability of TiO2 in SCW. All of the formaldehyde (HCHO) was converted to CH3OH, CO, CO2, and H2 at 400oC under supercritical conditions for all TiO2 morphologies. The highest H2 yield (57. 6 (mole) %) was determined on the TiO2 catalyst calcined at 550 oC.

Keywords: Tio2, Sol-Gel, SCW, Folmadehyde Decomposition

STABILITY AND ACTIVITY OF ZIRCONIUM OXIDE IN CATALYTIC SUPERCRITICAL WATER GASIFICATION OF FORMALDEHYDE

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Abstract:

The presence of heterogeneous catalysts in the reaction occurring in supercritical water (SCW) is required to increase the reaction rate and the selectivity of the desired product (such as H2, CH4). However, many of the heterogeneous catalysts in the reactions occurring in supercritical water (SCW) do not maintain thermal and hydrothermal stability. Also, in the present studies, there is little information on the changes in the thermal and hydrothermal stability of catalysts in SCW . For this reason, ZrO2 material, which is transparent, resistant to heat and electrical conductivity, chemically stable and has ionic conductivity at high temperatures, was selected to be tested in the gasification of formaldehyde in SCW. ZrO2 was synthesized by sol-gel method and calcined at 500, 900 and 1400 oC. Stability of ZrO2 samples which is fresh and used in the catalytic gasification of formaldehyde in the presence of SCW was determined by various methods such as FTIR, XRD, TEM, SEM, BET, TPO, H2 -TPR, zeta potential. In addition, the effect of catalyst amount, temperature, and reactant concentration and retention time on the yield of SCW gasification of formaldehyde with ZrO2 catalysts was investigated. ZrO2 samples calcined at 500 and 1400 oC mostly involve monoclinic and tetragonal phase, respectively and have nono-sized particles. However, ZrO2 calcined at 900 oC was found to exhibit amorphous structure. Based on formaldehyde activity results, the highest H2 yield was found at 0.5 g of ZrO2 for 20 (v/v) % formaldehyde in water at 400 oC.

Keywords: SCW, Formaldehyde, Zirconium Oxide, Gasification, Stability

INHIBITORY EFFECTS OF ZINC OXIDE NANOPARTICLES ON ANAMMOX PROCESS

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Abstract:

Nowadays, biological nitrogen removal in wastewater is commonly achieved by conventional nitrification denitrification processes. Nitrification is a process that requires large volumes due to slow growing nitrifiers and high energy for aeration. In addition, organic carbon is needed for the denitrification process. Wastewaters containing low organic carbon require the addition of carbon externally, which increases the cost of treatment. For these reasons, new microorganisms have been discovered as a result of researches and Anammox (Anaerobic Ammonia Oxidation) species have been nominated to find application area as an innovative technology instead of conventional nitrification denitrification processes. Anammox is a process that oxidizes ammonium nitrogen to nitrogen gas in anoxic environment where nitrite is used as an electron acceptor. Compared to conventional nitrification denitrification processes, the Anammox process requires less energy, does not require external carbon addition and produces less sludge. Therefore, the Anammox process is an innovative, effective and low-cost alternative for the treatment of wastewaters containing high nitrogen. In recent years, application of nanotechnology rapidly increased and the use of nanoparticles is now very common in industrial products. Because of their small size (1-100 nm) , nanoparticles can be more toxic than the larger particles in the bulk material. Nanoparticles after being used are discharged to domestic wastewater treatment plants and they effect the biological processes. Although there are numerous nanoparticles which are frequently used in industrial applications (ZnO, TiO2, Ag, CuO, Al2O3, SiO2, CiO2, etc.) zinc oxide nanoparticles are most common. The objective of this study is to investigate the zinc oxide nanoparticle inhibition in enriched Anammox culture in both batch and continuous systems. In this context, inhibition levels of zinc oxide nanoparticles will be demonstrated in batch systems. Thereafter, inhibition effects on continuous systems will be observed by increasing the nanoparticle concentration gradually.

Keywords: Anammox, Inhibition, Nitrogen Removal, Zno Nanoparticles

A MATHEMATICAL MODEL FOR ALLOCATION AND DISTRIBUTION OF HUMANITARIAN RELIEF TO DISASTER AREA

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Abstract:

Natural, technological or man-induced events that have the unpredictability in time, the intensity and the location are called as disaster. Disasters have a serious disruption on the functioning of a society and affect human life negatively due to destruction they create in the region. Existing local resources are often inadequate to remove these effects. Preparing societies and communities to crisis is a crucial task before and after the disasters and people are in the center of these preparation processes. Today, societies are aware of the need on developing efficient disaster management systems to minimize the loss of life and property caused by the disaster. Humanitarian logistics includes post disaster management activities such as search and rescue, evacuation, allocation of humanitarian relief and the establishment of the temporary shelter areas. The relief need by exposed people are met from the logistics warehouses established in different cities by the authorized institutions. A mixed integer linear programming model is developed to allocate relief to disaster area points from the warehouse in the transportation network with the aim of minimization of service time. Numerical results show that the developed model may be very useful in effectively planning distribution of humanitarian relief after disasters. Thus, the relief items can be delivered to the exposed people as early as possible.

Keywords: Humanitarian Logistics, Disaster, Relief, Mathematical Model

VARIABLE NEIGHBORHOOD SEARCH FOR THE HETEROGENEOUS FIXED FLEET VEHICLE ROUTING PROBLEM

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Abstract:

The vehicle routing problem (VRP) is a well-known transportation problem where a fleet of homogenous vehicles deliver goods from the depot to a number of customers. The heterogeneous fixed fleet vehicle routing problem (HFFVRP) is a more practical variant of vehicle routing problem. While the classical VRP assumes that the fleet owner has unlimited number of vehicles from one type, it is assumed that the fleet owner has various types and fixed number of vehicles in the HFFVRP variant. In practice, this variant may commonly be seen in designing daily service network of beverage, food and dairy transportation. Similar to VRP, this problem variation allows vehicles to make the delivery operations by visiting all clients at once with the aim of minimization of total travel distance. In this study, an efficient hybrid approach is proposed to solve the problem. In this approach, variable neighborhood search (VNS), savings heuristic and perturbation mechanism are combined with the help of efficient neighborhood strategies. The numerical results of a well-known number of benchmark instances show that the developed approach achieved best-known solutions reported in the literature. Additionally, the findings of this study indicate that the approach has the potential of enabling the decision maker to make effective decisions related to design of transportation networks.

Keywords: Vehicle Routing Problem, Heterogeneous Fixed Fleet, Variable Neighborhood Search

DETERMINING THE LOCATION OF A WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE) RECYCLING PLANT IN THE AGEAN REGION OF TURKEY

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Abstract:

Recycling electronic waste has become an important research area in recent years due to its potential benefits to economy and sustainable environment. The recycling of WEEE is also crucially important since it handles hazardous waste according to regulations and retrieves the valuable materials. One of the important issues in creating appropriate infrastructure to recycle WEEE is the selection of optimal location for the recycling plants. Although, there is a growing interest in the related literature, there are limited studies in developing countries to manage WEEE based on scientific findings. In order to contribute to the fulfillment of this need, a mixed integer linear programming (MILP) model is proposed to determine the optimal location of a WEEE recycling plant. The MILP model is applied to the case of Agean Region of Turkey.

Keywords: Weee, Recycling, Facility Location, Mixed Integer Linear Programming

REVIEW OF ESTIMATION METHODS FOR E-WASTE QUANTITIES AND THE APPLICATION OF SIMPLE DELAY METHOD FOR THE CASE OF TURKEY

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Abstract:

Electronic waste or e-waste is the fastest growing waste stream in the world. Both governments and civil initiatives are working together to create social awareness to struggle with sharply increasing e-waste production and to develop necessary management practices. Due to environmental, social, health and legal outcomes of e-waste, it has become important to construct sustainable e-waste management system. In order to create such an efficient system, the crucial data are related to the quantities of various type of e-waste coming into the waste recovery system. Therefore, estimation of these quantities becomes valuable. This study aims to review different estimation methods which mainly depend on input output analysis. The methods are evaluated in terms of their advantages, disadvantages and information needed to implement them for e-waste estimation. Then, in the study, The Simple Delay Method is used to estimate the quantities of waste white goods in Turkey. Refrigerators, washing machines, dishwashers, dryers, ovens and freezers are taken into account as white goods. The study contributes to the advancement of the e-waste related literature and adds benefit to understanding the e-waste potential of Turkey.

Keywords: E-Waste, Estimation, White Goods, Simple Delay Method

PROPERTIES OF PIEZOELECTRIC LEAD ZIRCONATE TITANATE CERAMIC FIBER CEMENT COMPOSITES

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Abstract:

Lead zirconate titanate (PZT) fibres have attracted engineers by being an active material, which is capable to transform mechanical energy into electrical signals and vice versa. Furthermore, these fibres can easily be integrated into composite structures. Availability of these materials has enabled the development of Fiber Composites, comprised of piezoceramic fibers embedded in a matrix. It is predicted that when these piezoelectric fiber composites are integrated into cement, piezoelectric characteristic of fiber composite layer will allow us to have an idea about the applied applied mechanical stress. In this study, the effect of the mechanically applied load on the piezoelectric properties has been investigated experimentally using a lead zirconate titanate (PZT) piezoceramic fibres. Mechanical loads were applied to PZT ceramics composite sample under compressive stress. The phase composition and microstructure properties were investigated by SEM analysis.

Keywords: Cement, Composite, PZT, Piezoelectric Ceramic Fibers

PROPERTIES IN THE COMPOSITES OF EPOXY-CEMENT-PZT CERAMICS POWDER

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Abstract:

Lead zirconate titanate (PZT) is one of the most widely studied ceramic materials for various areas. This ceramic material can be produced as a piezoelectric material which makes it desirable for many applications. It is extraordinary behavior has been known since mid 20th century. It is slightly a new material civil engineering but a good candidate for many applications. In this work, PZT was mixed with normal Portland cement at different ratio to produce composites. The influences of filler content and composite thickness on the composite properties were investigated. Morphology of the composites was characterized by scanning electron microscopy, mechanical properties of the samples were studied by uniaxial tension.

Keywords: Cement. Epoxy. Lead Zirconate Titanate Ceramic Powder. Composite.

CORRELATING SURFACE POTENTIAL WITH IRREGULAR PLASTIC DEFORMATION

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Abstract:

Surface potential of AA 3204 undergoing a serrated plastic flow (PLC effect) was monitored in a dilute brine electrolyte under various strain rates at 30 oC. Significant potential bursts at the launch of the stress drop regimes of the flow were revealed. The serration counts and frequency of the PLC effect matched with that of the bursts precisely, and average burst magnitude (□ V)□ was found to be directly proportional with that of the stress drops (□ □). The bursts were attributed to the electrons in strain fields of the slip steps exposed to the electrolyte during the local banding events. The utility of the electrochemical set-up for investigation of the PLC effect and monitoring deformation and damage progress of materials were affirmed.

Keywords: Plastic Deformation, PLC Effect, Surface Potential, Surface Films, Dislocations.

AN EXAMINATION OF DAYLIGHT USAGE OF FIRAT UNIVERSITY FACULTY OF ARCHITECTURE BUILDING WITH BIM

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Abstract:

The surfaces of building envelope are the intersections that create connections between buildings and external environment in terms of aesthetics, physics, and chemistry. The interior spatial conditions of a building are determined by the visual, thermal, and radial permeability of the building envelope. Daylight taken from the surfaces of building envelope has an effect on the indoor spatial comfort conditions like the users' health and the building's energy use. The use of daylight should be in sufficient amount especially for the needs of the places used during the day. In cases in which daylight is deficient, the need of artificial lighting and heating arises. Therefore, the users face the places that are uncomfortable in terms of interior spatial comfort and that consume a lot of energy. The effect of the use of daylight is a lot especially on the user comfort in education buildings. Benefitting from daylight is important for the users who spend most of their times at school in terms of mental efficiency and psychology. On the other hand, the need for an efficient building envelope design emerges in order to avoid physical problems' occurring among the users because intensive daylight tires their eyes and heats the place a lot. Fırat University Architecture Faculty Building, still under construction, was chosen as a sample case in this study. Sixty-five percent of the rough framing of the building has been completed. The building envelop was designed by considering construction and operation cost. The analyzes were made on the effect of the building envelop on the indoor daylight usage. The faculty building was modelled in Revit depending on the project assumptions such as like the building's plan layout, floor heights, envelop…i.e factors. Daylight analysis of the created model was made with BIM on the date of equinox.

Keywords: Educational Building Design, Daylighting Analysis, Revit, Bim

THE COMPARISION OF MONE'S BUILDING TYPES PROJECTS WITH MONE'S EDUCATION BUILDING STANDARDS AND THE EVALUATION OF THEIR CONSISTENCY

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Abstract:

The right to education that is guaranteed by several laws of the constitution reaches the individuals through the state's executive power. The executive tries to fulfill its actions depending on the mechanisms of equality and justice in education. The right to plan buildings and facilities belonging to education institutions of every level and kind was given to the Ministry of National Education (MoNE) by the Basic Law of National Education. The Ministry developed standards under the light of education standards and produced building types projects in order to meet the need of educational buildings around the country quickly and economically. By taking manufacturing cost, management, function, aesthetics, and the level of efficiency in education into consideration, the improved standards are definitely important for the students' and teachers' spatial comfort. In this study, the consistency between the Ministry's current project preparation regulations and its 2000.07-numbered sixteen-classroom high school building type project was evaluated by comparing them with each other.

Keywords: Educational Building Design, Project Standarts

ISOLATION AND CHARACTERIZATION OF TOTAL ENZYMATIC BIOACTIVE POLYPEPTIDES FROM SULUSARAY HOT SPRING

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Abstract:

The aim of this project is to examine Sulusaray hot spring, which is particularly preferred for dermatological diseases, in terms of bioactive polypeptides and to identify the active compounds in the therapeutic polypeptide structure. For this purpose, water samples from the Sulusaray hot spring were first filtered using 0,45 µm and 0,22 µm pore sized membranes followed by 3 and 30 kDa cut off nitrocellulose membranes. The concentration of protein extract, extracted from the filter papers was determined by the Bradford method. Extracted proteins were screened for their bioactivity. In this context, their antimicrobial activity against S. enteritidis, P. aeruginosa, S. pyogenes, K. pneumoniae, S. aureus, C. utilis, C. albicans, E. coli, B. subtilis and P. vulgaris were tested by spot on lawn method. Lipase, amylase, protease, oxidase and catalase enzymatic activities of the extracted polypeptides were also investigated. The bioactive polypeptides are displayed to be separated by SDS-PAGE method. Identification of polypeptide producer microorganisms were done by metagenomic analysis. As a result of the studies, it was found that the polypeptide mixture having a concentration of 65.5 µg / ml was effective against strains of S. enteritidis, C.utilis, C.albicans, E. coli, B. subtilis and P.vulgaris strains, and that have 1.384 U / ml amylase, 0.263 U / ml lipase and 1.64 U / ml protease enzyme activities. It has been found that the polypeptide mixture contains two separate polypeptides, predominantly 70 kDa and 35 kDa in size. Sequence analysis results revealed that the hot spring contains bacteria from the classes Proteobacteria, Bacteriodes, Chloroflexi, Deinococcus thermus and Cyanobacteria and fungi from the family Ascomycota. As a result, it is predicted that the bioactive polypeptide sources contained in the water are produced by these organisms.

Keywords: Bioactive Polypeptides, Sulusaray Hot Spring, Antimicrobial Activity, Sds-Page, Metagenomic

IMPROVING THE COLOR YIELD AND WET FASTNESSES BY SYNTHESIZING THE NEW DISPERSE AZO DYE

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Abstract:

The most important class of organic dyestuffs are azo dyestuffs. Azo dyes are characterized by the azo group, which is a chromophore group in their structure. The nitrogen atoms in this group are bonded to carbon atoms by sp2 hybridization. One of the carbon atoms attached to the azo group is the aromatic cyclic heterocyclic ring. The other is; an enolizable aliphatic group. The color yield and fastness properties of azo disperse dyes containing aliphatic groups are low. The purpose of this study is to improve the color yield and wet fastness of the azo dye by synthesizing the new azo disperse dyestuff. For this purpose; a new dyestuff has been synthesized in acidic medium which can be used instead of disperse blue 321 which is one of the most used dyestuffs in textile. The synthesis was carried out in two steps, namely diazotization and chelation. The absorbance values of the dyes synthesized in standard and acidic media were measured by UV-visible spectrophotometer. Color yield values were obtained from these values by the calculation method. According to standard dyes, a 44% increase in the color yield of the disperse blue 321 dyes synthesized was obtained. It has been found that the new dye synthesized has less contamination of the multifiber fabric as a result of washing fastness according to ISO 105 C06, B2S standard.

As seen in the structure of newly synthesized Dispers Blue 321 dye; there are two interconnected benzene rings connected to the azo group at the clamping part. This leads to increased unsaturation and color yield in the structure. At the same time it causes less pollution in washing fastnesses.

Keywords: Organic Dyestuff, Azo, Color Yield, Wet Fastness

CONSTRAINT-BASED DESIGN AND DEPENDENCY ANALYSIS

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Abstract:

An engineering design problem is usually represented by a set of constraints which are expressed as functions of specifications and decision variables. Design may be defined as the process of determining appropriate values of the decision variables provided that constraints and design specifications are given. The aim is to generate a design that satisfies all constraints. Constraint-based design represents and operates upon constraints. It has been recognized as a strong tool for achieving intelligent support of design, particularly the design of mechanical parts or assemblies. In this study, a methodology is presented to find feasible solutions for constraint-based designs. A network model is used to represent relationships among design variables.

Keywords: Constraint-Besed Design, Dependency, Feasibility

OPTIMIZATION AND VALUATION OF EXPANSION FLEXIBILITY IN MANUFACTURING INDUSTRY

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Abstract:

Flexibility allows firms to compete more effectively in a world of substantial price and demand uncertainty, product variety, short product life cycles, and rapid product development. Throughout the life of a project, managers must react to events as they unfold. Real options approach seeks to quantify the value of flexibility and to determine the optimal managerial decisions. In this study, real options approach is presented to evaluate the flexibility to expand the capacity using a case study for a cell phone manufacturing firm that is unsure of the market demand of its new products. Valuation of the option is demonstrated using binomial trees. Optimal decisions for each state are shown on the tree.

Keywords: Flexibility, Real Options, Decision Making, Valuation, Optimization

INVESTIGATION OF RENEWABLE ENERGY RESOURCES POTENTIAL IN THRACE REGION

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Abstract:

Thrace within the borders of Turkey that is called Eastern Thrace in the international public is the name given to the northwest of Turkey that it is also the part of Southeastern Europe. The Trakya region includes three provinces in Marmara region (Edirne, Kırklareli, Tekirdag) and as well as those territories on the European Continent of the provinces of Canakkale and Istanbul. The Thrace region within the borders of Turkey has a surface area of 23,764 km2. It accounts for 3% of Turkey's land area.

When viewed from the perspective of renewable energy sources, this region seems to be in good position in terms of Wind Energy and Biomass Energy respectively. On the wind maps, the region was found to be in the favorable condition in terms of wind speed and elevation. According to the Turkish Wind Energy Association (TWEA), the Thrace region accounts for about 25% (350 MW) of the wind energy production in Turkey. Thrace region is available for biogas production, because of the livestock activities and suitable for energy forests because of the forests in the region. According to Electric Generation Inc., although the region of Thrace has a 430MW biogas power energy potential the installed power of the biogas energy is 11MW currently.

In this study, the potential of renewable energy resources of the Trakya region will be examined firstly. It will be argued that how much of the existing potential has been gained to the economy of the country by the establishment of a power plant.

Keywords: Thrace, Renewable Energy, Wind, Biomass, Biogas, Turkey

NOVEL USE OF WEB 2.0 TECHNOLOGIES TO ACQUIRE 21ST CENTURY TECHNOLOGY LITERACY SKILLS: CASE STUDIES

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Abstract:

This reach suggests a general approach for productive use of Web 2.0 technologies during the educational journey of high schoolers and college students. Technology literacy is defined as "the ability to responsibly use appropriate technology to communicate, solve problems, access, manage, integrate, evaluate, design and create information to improve learning in all subject areas, and acquire lifelong knowledge and skills in the 21st century" by The Colorado Department of Education (CDE). The starting point of our research was using two online technologies, Voice Thread and Google Documents, for the instruction of an authentic Mathematics curriculum and exploring impacts on high school students' attitudes and learning. In that study students used Voice Thread, an interactive presentation tool, to present their solution to short questions as a part of bigger mathematics problems; and they worked as groups on Google Documents to solve more complex decision making problems. Voice Thread participations aimed to encourage asynchronous communication between teacher and students, while group work on Google Documents enhanced opportunities for student-student dialogue and collaboration. The effort to help students acquiring technology literacy skills continued with pre-service teachers at College of Education at a public university in Turkey. Several Web 2.0 technologies including presentation tools, e-book creation tools, online tools; concept mapping and other tools for creating visual educational materials, like cartoons and animations, etc. In-class sessions, instructor was demonstrating each single step to use the tools and students followed from the big screen, and students had weekly homework to create learning materials related a topic from their particular field of study, which included Science and Technology Education, Mathematics Education, Elementary Education and English Education departments, using the tools. Despite of which department they were in, teacher candidates demonstrated higher competency levels for all content development areas.

Keywords: Web 2.0, Education, Online

MULTI-OBJECTIVE ARTIFICIAL BEE COLONY ALGORITHM TO ESTIMATE TRANSFORMER EQUIVALENT CIRCUIT PARAMETERS

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Abstract:

Real world problems such as scientific, engineering, industrial problems are in the form of the multi-objective optimization problems. In order to achieve optimum solutions of such problems, multi-objective optimization algorithms are utilized. In this study, the problem is estimation of single-phase transformer parameters which is one of the engineering problems. This estimation is provided by artificial bee colony (ABC) algorithm. ABC is developed as a metaheuristic method and simulates foraging of bees. Since the problem is a multi-objective optimization problem, multi-objective ABC (MOABC) is proposed to estimate parameters in the study. This study aims to estimate equivalent circuit parameters using current and voltage values at any known load. Through algorithm, difference between actual and estimated parameter values that is the error has been tried to minimize. The successful results show that the proposed method can be used for a single-phase transformer parameters estimation.

Keywords: Multi-Objective Artificial Bee Colony Algorithm, Multi-Objective Optimization, Transformer Parameter Estimation

USE OF SILVER NANOPARTICLES IN PLANT BIOTECHNOLOGY

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Abstract:

Nanotechnology is being used effectively in many areas contemporarily. Silver nanoparticles are one of the most used materials in antibacterial and antiseptic practises. They are also eco-friendly and have relatively low toxicity towards humans. They can be synthesised by chemical, physical, photochemical and biological procedures. In all methods, nanoparticles are formed by reducing of the silver ions to silver elements using reducing agents. In biological synthesis, silver nanoparticles have been synthesized by using plant extracts by a method named “green synthesis” or “green bio-reduction”. This method eliminates expensive and toxic substances as reducing and stabilizing agents.

In plant biotechnology, silver nanoparticles have been used in elicitation of cell and tissue cultures of medicinal plants in order to trigger metabolic pathways and enhance secondary metabolite production. Moreover, biologically synthesised silver nanoparticles have been used in surface sterilization of plant explants prior to cultivation. They showed no adverse effects (such as browning, prevention of cell division, germination, growth and callus formation) towards seeds and explants. This surface sterilization method may be more helpful than currently used methods, especially for delicate plant explants which are easily damaged by commonly used surface sterilizing agents such as sodium hypochloride. These studies about nanoparticles associate plant biotechnology and nanotechnology for better, more practical and beneficial applications.

Keywords: Silver Nanoparticles, Plant Biotechnology, Elicitation, Surface Sterilization

THE FIRST PROTOTYPE OF SELECTIVE LASER MELTING MACHINE IN TURKEY

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Abstract:

Selective laser melting (SLM) is an additive manufacturing (AM) method which uses a laser power source to produce 3D desired parts using powder materials (PM). The technological advantages that may be achieved during product design, development and manufacturing have made this production technology popular. Unlike conventional production methods, AM requires no additional tooling during the production process and it allows the production of parts in complex geometries. For this reason, studies on this subject have increased considerably in the world. The aim of this work is to design and manufacture a prototype SLM machine which has open architecture to produce 3D metallic parts. Using this prototype, it will be possible to make research or production with any requested materials. Experimental studies have been carried out to perform machine capabilities. Results are very promising for producibility of three dimensional metallic parts. Furthermore, this prototype is the first SLM machine built in Turkey.

Keywords: Additive Manufacturing, Slm, 3d Printing

MATHEURISTICS AS A NEW PROBLEM SOLVING TOOL

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Abstract:

Matheuristics are optimization algorithms which combine the properties of both mathematical programming and metaheuristics in order to solve hard optimization problems. As it is clear that mathematical programming is not sufficient to solve hard optimization problems in reasonable solution times, but these exact methods guarantee optimal solutions. From another point of view, metaheuristics give a solution in very short time periods for even the hardest optimization problems where the optimality is never guaranteed. In this study, the basics of matheuristics are introduced as a new tool in solving optimization problems based on the recent literature applications.

Keywords: Matheuristics, Optimization

NEW RESEARCH PERSPECTIVES IN REVERSE LOGISTICS

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Abstract:

Reverse logistics may be defined as the flow of end-of-life products from customers to producers in order to recover value using appropriate methods. Reverse logistics takes attention both in the literature and in application due to the cost advantages it serves for the companies and also the legislative requirements. Reverse logistics is an efficient way of decreasing solid waste, collecting resources and use them again in production. In this study, the basic issues and problems in reverse logistics is considered and new research perspectives are discussed based on recent literature.

Keywords: Reverse Logistics, Value Recovery

A HIGH RESOLUTION DDFS DESIGN ON VHDL USING BIPARTITE TABLE METHOD

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Abstract:

In this study, a Look Up Table (LUT) based Direct Digital Frequency Synthesizer (DDFS) is designed on VHDL. Bipartite Table Method, an advance memory compression method, is used together with quadratic compression method. 23 mHz frequency resolution is achieved with 100MHz clock input. The required memory is obtained 585 times smaller than traditional DDFSs. A MATLAB code is revealed to select the best design which provides the smallest required memory for 100 dB Spurious Free Dynamic Range (SFDR) level. The contents of the LUTs are also evaluated by using MATLAB software. The design is simulated for multiple frequencies between 23mHz-30MHz with VIVADO 2016.3 software. The simulation results perfectly match with calculations.

Keywords: Bipartite Table Method, Quadratic Compression, Ddfs, Dds, Vhdl.

FPGA REALIZATION OF EKF BASED SPEED-SENSORLESS DRIVE WORKING IN FIELD-WEAKENING REGION

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Abstract:

This study presents a field programmable gate array (FPGA) implementation of the extended Kalman filter (EKF) for speed-sensorless direct vector control (DVC) of the induction motor (IM) in a wide speed range including the filed weakening region. A Hardware in the Loop (HIL) platform is set for the control and estimation performance tests of the EKF-based speed-sensorless DVC system with utilization of Very high speed integrated circuit Hardware Description Language (VHDL). The EKF-based estimator developed for the estimations of αβ- stator stationary axis components of the stator currents (isα and isβ), αβ- stator stationary axis components of the rotor fluxes (ϕrα and ϕrβ), rotor angular velocity (ωm), rotor resistance (Rr), and magnetizing inductance (Lm) is implemented on the Xilinx Virtex 5 FPGA. The FPGA provides efficient design and implementation of the EKF based speed-sensorless DVC system since it helps to decrease the computation/sampling time of the whole system due to its parallel signal processing ability. The space vector pulse width modulation (SVPWM) method is also implemented on the FPGA platform for switching the voltage source inverter (VSI). The estimation and control performance of the proposed sensorless drive system is tested by varying Rr, Lm, and load torque (tL) in HIL simulations for a wide speed range including zero speed and field-weakening region. The obtained results prove the effectiveness of the proposed EKF based speed-sensorless drive and its FPGA implementation.

Keywords:FPGA; Field-Weakening Region; Extended Kalman Filter

REDUCED-ORDER UNSCENTED KALMAN FILTER BASED LOAD TORQUE AND ROTOR RESISTANCE ESTIMATIONS FOR SPEED-SENSORLESS CONTROL OF INDUCTION MOTORS

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Abstract:

In this paper, the simultaneously estimations of rotor fluxes, rotor mechanical velocity, load torque including viscous friction term, and rotor resistance are performed by using a novel reduced-order unscented Kalman filter (ROUKF) for speed-sensorless vector control of induction motors (IMs). The estimation performances of speed-sensorless IM drives are affected by frequency dependence variations in electrical model such as rotor resistance and unknown mechanical parameters of mechanical model such as load torque. In order to obtain high performance estimations, those variations must be updated or included to the estimation algorithms. For this purpose, novel ROUKF algorithm which is firstly introduced in the literature is developed and tested with simulations for a wide speed range including zero speed under load torque and rotor resistance variations.

Keywords: Induction Motor, Reduced-Order Unscented Kalman Filter, Rotor Resistance Estimation, Speed-Sensorless Control

EFFECTS OF MALEIC ANHYDRIDE GRAFTED RECYCLED LOW DENSITY POLYETHYLENE ON BITUMEN

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Abstract:

Modification of bitumen is a widespread phenomenon around the world mainly on the purpose of acquiring better performance properties by decreasing temperature dependency of bitumen which leads to diminish permeant deformation on highways such as rutting.

This paper is aimed to investigate the modification of bitumen maleic anhydride (MAH) grafted recycled low density polyethylene (LDPER-MAH). Maleic anhydride was dissolved and mixed with recycled polyethylene which was observed by the Fourier infra-red (FT-IR) spectrum. Subsequently, Six different binders (one base and five modified) were prepared with pre-treated LDPER granules to investigate the effects of the modifier on properties of bitumen.

Conventional tests such as penetration, softening point and ductility were conducted on base and LDPER-MAH modified binders to examine physical changes in bitumen after modification. Rolling thin film oven test (RTFOT) was applied to base and modified bitumen to investigate effects of LDPER-MAH on short term aging properties of bitumen. Rotational viscometer (RV) and dynamic shear rheometer (DSR) was used to determinate viscosity of the binders.

Complex shear modulus (G*) and phase angle (δ) parameters of base and modified bitumens were measured with frequency sweep test by means of dynamic shear rheometer (DSR). The tests results reveal that a gradually increment in LDPER-MAH modification leads to a decrease in penetration and an increase in softening point which is evidence of an increased stiffness of bitumen. An increment in rutting parameter after modification observed by DSR test is a clear indication of better rheological properties of bitumen which means permanent deformation occurred in flexible pavement can be restrained by LDPER-MAH modification.

Keywords: Recycled Polyethylene, Bitumen, Modification, Maleic Anhydride, Graft

STRENGTH PROPERTIES OF KAOLIN TREATED BY GUAR GUM

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Abstract:

Soil improvement methods are generally preferred to achieve the desired engineering properties of weak soils. Within the developments in technology, the ground improvement methods and binder additives must be environmentally friendly and economical. Therefore, eco-friendly additives are recommended to prevent pollution. Biopolymers are natural polymers produces by living organisms and are considered eco-friendly additives. However, biopolymer treated soil behavior is relatively unknown because the physical and chemical properties of biopolymers widely vary depending on their compositions and types. In this study, the effect of guar gum on mechanical properties of kaolin clay was investigated. Guar gum is a galactomannan and the ground endosperm of guar beans. To prepare the specimens for testing, necessary amount of guar gum (0.5, 1 and 1.5) was initially mixed with kaolin and then water is added. Specimens were compacted using standard proctor energy at four different water contents. A dimension of 50×100 mm was selected for unconfined compression tests. After 7 and 28 days curing period, specimens were subjected to unconfined compression test. According to the results obtained from this experimental study; at lower water contents, unconfined compression strength increases with guar gum increment. Furthermore, guar gum contained specimens with high water content showed more ductile behavior.

Keywords: Guar Gum, Kaolin, Unconfined Compressive Strength

AN INVESTIGATION OF ELECTRICAL RESPONSE ON INTERLEAVED BUCK CONVERTERS USING DIFFERENT TYPE CURRENT CONTROL METHODS

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Abstract:

DC converters are widely used in industrial area. Rapidly advancing technology is increasing the expectation of more efficient and smaller size power electronics systems. Adjusted DC voltages required by electrical loads are often provided by DC converters. The coexistence of the same converter types brings advantages such as increased system durability and fault tolerance due to current sharing capability. The use of interleaved switching signals in parallel-connected power converters is one of the preferred methods because it reduces the overall system size by reducing filter element size. In this study, the continuous transfer mode of the vine buck converter; The unit power factor (UPF) and the total harmonic distortion (THD) of the input current are investigated using proportional-integral (PI) control and avarage sliding mode control (ASMC). The Buck-boost Converter simulates Matlab / Simulink at 100W power and 20 kHz switching frequency and analyzes the control methods. In the analyzes, the THD effect of the converter's response to the load changes in the control methods and other parameter changes was investigated.

Keywords: Proportional-Integral (PI) Control; Avarage Sliding Mode Control (ASMC); Unit Power Factor (UPF); Total Harmonic Distortion(THD)

DESIGN OF AN INTELLIGENT CONTROL SYSTEM TO PREVENT THE FERRORESONANCE EFFECT IN MEASURING TRANSFORMERS

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Abstract:

Voltage and current transformers used for measurement and protection are one of the most used elements of the power system. The B-H characteristic of the transformers provides electromagnetic energy conversion in a linear region with a high efficiency. With the transformer's ferromagnetic core saturating, the energy conversion efficiency begins to fall. Nonlinear inductance of the transformer and elements such as resistance and capacitance in the nonlinear loads of the power system connected to the current transformer has the potential to interfere suddenly and cause a ferroresonation phenomenon. In this study, it has been determined that transformers, especially those operating in high voltage systems and compensation plants, produce destructive electrical parameters in the system due to the fact that they work together with the continuous closing-opening switches. It has been determined that it is possible to remove randomly operated switch-off openings which cause this destructive condition by means of a control system operating at appropriate times using semiconductor switches.

Keywords: Current Transformer, Voltage Transformer, Ferroresonance, Switch Position Control, Power Systems

IN VITRO AND IN VIVO INVESTIGATION OF CYTOTOXIC AND NEUROTOXIC EFFECTS OF SOME MARINE ALGAE ON MOUSE NEUROBLASTOMA CELL LINE (NA2B)

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Abstract:

This study aimed to investigate the cytotoxic and neurotoxic effects of extracts from some marine algae samples in vitro on mouse neuroblastoma (NA2B) cells. In the second step of our study, it was aimed to evaluate neurotoxic damage on mouse brain tissue in vivo by high-acting algae extracts by clinical and histological methods.

The cytotoxic and neurotoxic activities were studied of red, brown and green algae collected from the Aegean Sea coasts of Turkey. The algae extracted with methanol (MTH), chloroform (CLF) and some different extraction methods. NA2B cells were cultured in DMEM containing 10% FCS, 1% L-glutamine and 1% penicilin-streptomycine. The effects of the extracts on vitality and proliferation measured with 3-[4,5-dimethylthiazol-2-yl]-2,5-diphenyltetrazolium bromide (MTT). The in vivo toxic effect study was performed with total thirty adult male wistar albino mices (approximately 12 weeks old and weighing 200 ± 30 g). For this purpose, algae extracts were given to mouse as intraperitoneal route, directly into the abdomen. Clinical evaluation was done with Tarlov scoring. For histological evaluation, TUNEL system kit was used and applied to sections taken from paraffin blocks with a thickness of 5 µm.

According to Tarlov scoring results; while J. longifurca CLF showed the most toxic effect with slow attack and J. longifurca MTH sudden attack tremor, H. tuna CLF and H. tuna MTH showed similar toxicity compared to D. fasciola CLF and D. fasciola MTH. Brain and cerebellum were removed and examined by routine histological method in order to understand the mechanism of toxic effect in vivo revealed by Tarlov scoring.

Histopathologic findings were found which accompanied these clinical findings and revealed significant changes when compared with control. In addition, morphometric examination showed toxic effect for different algae and extracts. These results are very important for human health and also significant for drug development.

Keywords: Marine Algae, Extraction, Cytotoxicity, Neurotoxicity, In Vitro, In Vivo, Mouse.

EVALUATION OF FT-PARAFIN MODIFIER ON PHYSICAL PROPERTIES OF BITUMEN

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Abstract:

Modification of bitumen is a widespread phenomenon around the world mainly on the purpose of acquiring better performance properties by decreasing temperature dependency of bitumen which leads to diminish permeant deformation on highways such as rutting. In addition to performance enhancer modifiers, there are some other types of modifier such as mixing and compaction temperature reducer of bitumen so as to decrease cost and energy consumption during hot mix asphalt preparation.

In this study, it was aimed to investigate the effects of FT-Parafin (FT)/Sasobit®, a warm mix asphalt modifier, on physical properties of bitumen. To this end, FT-Parafin (FT)/Sasobit® was added to bitumen having 160/220 penetration grade by amounts of 3%, 4%, 5%, 6% total weight of mixture. After preparation of modified binders, pure and FT-Parafin (FT)/Sasobit® modified bitumens were applied to a testing program. Conventional tests such as penetration, softening point and ductility were conducted on the binders in order to examine physical changes after modification.

Rotational viscosity test was used to determine viscosity of pure and FT-Parafin (FT)/Sasobit® modified binder. Mixing and compacting temperature of binders were also calculated to investigate flow properties. Dynamic shear rheometer (DSR) was employed to determinate high temperature performance grade of base and modified binders.

Tests results indicate that the using FT-Parafin (FT)/Sasobit® modified in bitumen increase flow properties of bitumen that might provide cost and energy savings which is also important for environmental awareness.

Keywords: Bitumen, Modification, FT-Parafin, Rotational Viscometer, Dynamic Shear Rheometer

PERFORMANCE BASED SEISMIC DESING OF STEEL FRAMES USING TLBO AND JAYA

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Abstract:

In this paper, a performance-based optimal seismic design of steel frames are presented utilizing Teaching-Learning Based Optimization (TLBO) and JAYA. These meta-heuristic optimization algorithms have been recently developed and employed in many optimization problems showing a high capability in structural optimization. In the analysis process, Determination of the performance levels of structural systems by the Displacement Coefficients Method, which are used to determine performance levels of structures by considering structural capacity obtained from pushover analysis is intended At the push over step where target displacement is calculated by the Displacement Coefficient Method. Plastic rotations of beams, columns and relative displacements at story levels are determined. Two numerical examples which have been previously considered in literature are studied and the results illustrate significant improvement in structural weight compared to the conventional design methods. The capabilities of the TLBO are compared to with JAYA

Keywords: Pushover,Performance Based,Seismic Desing,TLBO,Jaya

COMBINED NATURAL CONVECTION AND THERMAL RADIATION IN AN INCLINED CUBICAL CAVITY WITH A RECTANGULAR PINS ATTACHED TO ITS ACTIVE WALL

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Abstract:

Three dimensional combined natural convection and thermal radiation in an inclined cubical cavity with pins attached on the active wall is investigated numerically. The vertical opposing walls are heated and cooled while the other walls are assumed to be adiabatic. The governing flow, momentum equations and the radiative transfer are solved using Fluent 6.3 CFD software. In the discretization of the convection terms, the second order upwind scheme and for the solution algorithm SIMPLE is used. The cavity is filled with air and is considered to be laminar; the properties of air are assumed to be constant except for the density variation for which the Boussinesq approximation is used. The surface to surface (S2S) heat model is used for radiation. The computations are performed for Rayleigh number in the range 10^3≤Ra≤10^6, the surface emissivity (ε) 0≤ε≤1 while the inclination angle is varied 0°≤ϕ≤75°. The mean Nusselt number for convection and radiation were evaluated as a function of Ra number and for some cases, fluid flow patterns and the temperature distributions were analyzed. The results showed that the mean total and radiative Nu number increases monotonically with increasing Ra number and the surface emissivity.

Keywords: Heat Transfer, Inclined Cubical Cavity, Natural Convection, S2S Radiation

EFFECTS OF NITROCARBURIZING ON THE CORROSION BEHAVIOR OF AISI 4140 STEEL

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Abstract:

The aim of this study is to investigate the corrosion resistance of AISI 4140 steel surface coated by nitrocarburizing technique, more commonly known as tennifer. AISI 4140 steel samples were coated with nitrocarburizing technique in a sodium cyanide salt bath for 1, 2 and 3 h. The electrochemical corrosion behaviors of the uncoated and coated samples were investigated with potentiodynamic polarization technique in an air-saturated 3.5 wt% NaCl solution at pH value of 7 at room temperature. Scanning electron microscopy (SEM) with energy dispersive spectroscopy (EDS) and X-ray diffraction (XRD) were used for the characterization of the samples. The effect of nitrocarburized coating on the corrosion characteristic of AISI 4140 steel surface was determined and results were compared with results of the corrosion rates of the uncoated steel surfaces.

Keywords: Nitrocarburizing, AISI 4140 Steel, Potentiodynamic Polarization, Corrosion

SYNTHESIS, CHARACTERIZATION AND OPTICAL PROPERTIES OF THE PMMA BASED NANOCOMPOSITES

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Abstract:

In this study, the characterization and optical properties of the polymethyl methacrylate (PMMA) based nanocomposites were investigated. For this purpose, zinc oxide, iron oxide and mixture of zinc oxide iron oxide(hybrid) nanoparticles were reinforced PMMA polymers with a solution casting method. Production of the hybrid zinc-iron oxide nano particles were obtained by the mechanical milling with zinc oxide and iron oxide that have the equal ratios. To produce PMMA based nanocomposites, nano particles and PMMA granules were mixed with acetone and poured onto a glass mold and kept under vacuum for curing. These obtained composites were characterized by using a scanning electron microscopy (SEM) and an X-ray diffraction (XRD). Additionally, the optical properties of the PMMA based nanocomposites were investigated with an UV-visible spectroscopy.

Keywords:PMMA, Optical Properties, Zinc Oxide Nanoparticles, Iron Oxide Nanoparticles

INVESTIGATION OF SURFACE AREA OF NICKEL-COATED MULTI-WALLED CARBON NANOTUBES AT DIFFERENT PH CONDITIONS

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Abstract:

Multi-walled carbon nanotubes are highly preferred materials in applications where physical adsorption is required due to their high chemical stability, large surface areas, regular nanometric microstructures. Multi-walled carbon nanotubes are doped in various metals in order to increase the adsorption by increasing the surface area of the nanotubes. This study was designed based on this phenomenon, multi-walled carbon nanotubes were coated with Nickel in parallel to increase the surface area of the carbon nanotubes porosity. The carbon nanotubes which was coated with nickel were treated with solutions at different pH conditions. Then, changing of surface area of these carbon nanotubes was observed, and the correlation between them was shown. Moreover, the structure of carbon nanotubes treated with solutions having pH<2 and pH>12 showed different morphology from other multi walled carbon nanotubes. The nature of the nanotubes which was treated with different pH values was studied using high-resolution transmission electron microscopy (TEM) and energy-dispersive X-ray spectroscopy (EDX). Consequently, in the light of the data obtained from this experimental study, these nanotubes, whose surface areas are increased, can more effectively adsorb heavy metals such as iron, cleaning of water, storage of hydrogen energy, and construction of biosensors.

Keywords: Ni Coated Carbon Nanotubes, pH, Physical Adsorption

MECHANICAL CHARACTERISATION OF GLASS/FLAX WOVEN FIBRE REINFORCED HYBRID COMPOSITES

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Abstract:

Tensile and flexural behaviour of flax fibre and glass fibre reinforced polyester matrix composites were studied and fracture surface of the composites were characterised by electron microscopy. An aim of the study is to investigate the effect of fabric stacking sequence and hybrid concentrations of natural and synthetic fibres on mechanical behaviour of the composites. The properties of the hybrid composites were also compared with pure glass and pure flax reinforced composites. Bi-directional flax fabrics and glass fibre fabrics were used with thermoset polyester matrix by hand layup method for laminates manufacturing. I was found that the fabric sequence effected both the tensile, flexural strength failure strain except Young's modulus of the composites. The composites with a sequential fabric array showed significantly higher strength than those in composites with block fabric array. The highest tensile and flexural properties were obtained (250 MPa, 350 MPa) in pure glass fabric composites. However, pure flax fibre composites gives lower tensile strength and modulus (76 MPa - 6.7 GPa) and significantly higher strain to failure (8 %) compared to other fibre composites. Hybrid composites with flax/glass fibres showed comparable specific modulus with pure glass composites.

Keywords: Glass, Flax,Polyester, Hybrid, Composites, Tensile, Flexural

TENSILE PROPERTIES OF CARBON/JUTE WOVEN FIBRE REINFORCED POLYESTER COMPOSITES

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Abstract:

Carbon fibre/Jute fibre reinforced polyester composites were manufactured by compression moulding. Tensile behaviour of jute/polyester, carbon fibre/polyester, and carbon/Jute polyester composites were studied and fracture surface of the composites were characterised by electron microscopy. The study aims to analyse the influence of fabric type, fibre volume fraction of carbon fibres and hybrid combination of synthetic and natural fibres on tensile behaviour of the composites. The properties of carbon fibre reinforced polyester composites were obtained in different fibre volume fractions. The result showed that fabric type affected tensile properties of the composites. The highest tensile strength and modulus were obtained in unidirectional plain weave of carbon fibre composites at 32 vol% fibre content (505 MPa, 69 GPa). When neat unsaturated polyester matrix panels was reinforced with jute fibres with 23 vol% fibre content, composites showed higher tensile strength of 30 MPa and Young's modulus of 5,3 GPa The performance of the jute fibre composites were increased. Tensile strength and Young's modulus of carbon/jute fibre hybrid composites was found to 90 MPa and 10 GPa, respectively.

Keywords: Carbon, Jute, Polyester, Hybrid, Woven, Volume Fraction, Tensile Testing

MOLECULAR DYNAMICS SIMULATION OF MECHANICAL PROPERTIES OF HYDROXYAPATITE AND CARBON NANOTUBE-REINFORCED HYDROXYAPATITE NANOCOMPOSITE

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Abstract:

We present, for the first time, a classical MD simulation of the stress-strain properties of the pure Hydroxyapatite (HAP) molecule, Ca10(PO4)6(OH)2 and also nanocomposite made from HAP and carbon nanotube (CNT) without the use of any functional groups. HAP molecule is one of the most important and stable calcium phosphate bioceramic minerals and forms the primary structural component of the bone and materials for bone implant. Despite these excellent properties, HAP is mechanically quite weak and brittle, having a rather low tensile, compressive and flexural strength, which severely limits its use in applications in which load bearing is important. Several methodologies have been proposed to offset these mechanical weaknesses. Amonge these, the suggestion to reinforce HAP with CNT is particularly attractive since it has also been shown experimentally that tissue engineering scaffolds made of CNT can promote the proliferation of the bone-forming cells, namely the osteoblasts. We determine the Young modulus and the yield points of both pure and nanotube-reinforced HAP.

The computed values of Young modulus for pure HAP from all these simulations are well within the range of the experimental data. It is seen that while there is no enhancement of the magnitude of the Young modulus of the reinforced HAP, vis-a-vis the pure HAP, there is, however, a significant change in the yield strain of the reinforced nanocomposite. This increase in ductility can be usefully exploited in HAP-based bioceramics employed in such areas of medical nanotechnology as bone-replacing tissue engineering. Furthermore, to investigate the effect of nanotube functionalization on brittle-ductile transition behavior of CNT/HAP composites, a system with different amount of cross-links (functional groups) will be presented and discussed.

Keywords: Hydroxyapatite, Carbon Nanotube, Mechanical Properties, Nanocomposites, Molecular Dynamics, Ductility

EFFECTS OF A NEW VIRTUAL REHABILITATION SYSTEM AFTER ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION – MARVAJED

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Abstract:

Improvements in technology have made virtual rehabilitation (VR) popular and available in various rehabilitation systems. In recent years, many different technologies on VR have been produced and used in research. However, these technologies have been generally studied in neurological patients. Thus, it is necessary to investigate the effects of a new VR system in orthopaedic patients. The purpose of this study was to investigate the effects of VR system using MarVAJED which provides visual and auditory stimulus aimed for educating and controlling the joint on patient outcomes in individuals with ACL injury. Eighteen patients with ACL reconstruction were participated in this study. In addition to conventional physiotherapy, VR treatment applied with visual and auditory stimulus for a total of eight weeks, three sessions per week. Visual and auditory stimulus were applied via MarVAJED, which was developed by Marmara University, to aim for educating and controlling the joint as VR system. Before and after intervention, proprioception was measured with Biodex System Pro 4 Isokinetic Dynamometer, activity level and functional status were measured with Tegner Activity Scale, Lysholm Scale, respectively. Muscle stiffness and tone were measured with Myoton Muscle Pro device. There were statistically significant improvements in measures of proprioception, activity level, and functional status between pre- and post–treatment ($p<0.05$). No significant differences in measures of muscle stiffness and tone after the treatment ($p>0.05$). We concluded that this new VR system known as MarVAJED effectively treat ACL patients by improving proprioception, activity level, and functional status. Integration of technology into rehabilitation programmes may enhance assessment and rehabilitation. New technology systems may be more effective in increasing quality of life of patients.

Acknowledgement: This study was supported by Marmara University, Scientific Research Research Projects Committee (Project Number: SAG-C-DRP-200716-0374) and TUBITAK, The Scientific and Technological Research Council of Turkey (Project Number: 115E351).

Keywords: Virtual Rehabilitation, Anterior Cruciate Ligament, Physiotherapy

INTER-RATER AND INTRA-RATER RELIABILITY AND VALIDITY OF MARVAJED TECHNOLOGICAL SYSTEM FOR MEASURING KNEE JOINT POSITION SENSE

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Abstract:

Although the assessment of JPS has become a common measure in research, no one standard method for measuring it has been established. Typically, studies have used isokinetic dynamometer or video analysis systems to perform this test; however, this involves expensive tools or a laborious process. However, the current technological instruments to measure this ability use sophisticated and non-portable tools, or involve very labour-intensive measurements to obtain the necessary proprioceptive values. The main objective of the research was to develop a technological system called MarVAJED for assessing joint position sense and to analyse the reliability and validity of this new method in assessing the knee joint position sense. Thirty-two healthy subjects were voluntarily participated in this study. In this study, the active reproduction of the joint position (ARJP) was used for measuring the joint position sense by MarVAJED. MarVAJED is an electronic goniometer that allows continuous evaluation of the deviation angle of 0.10. MarVAJED operates under both direct and smart phone.

Intraclass correlation coefficient (ICC) and standard error of the mean (SEM) were calculated to determine the validity and reliability of the MarVAJED. Interrater and intrarater intraclass correlation coefficients ranged 0.82 to 0.88 for rater 1 and 0.84 to 0.94 for rater 2 in measurements of three different angles. There was excellent reliability in the measurements of all three different angles for MarVAJED technology system. In addition, MarVAJED showed strong validity. MarVAJED technology system are reliable and can be used by clinicians during rehabilitation of knee injuries. Using these portable and electronical technologic systems could take advantage to monitor proprioceptive deficits in athletes.

Acknowledgement:

This study was supported by TUBITAK, The Scientific and Technological Research Council of Turkey (Project Number: 115E351).

Keywords: Joint Position Sense, Technological System

THE EFFECTS OF INTERCRITICAL ANNEALING TEMPERATURE ON THE HARDNESS OF STEEL MATERIALS IN ACCORDANCE WITH TRIP CONCEPT IN DIFFERENT COMPOSITIONS

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Abstract:

In recent years, interest in TRIP steels has increased progressively. TRIP steels, an advanced steel type, have become a center of attention in the automotive industry with excellent strength and ductility. For the passenger safety, vehicle lightness and fuel emissions, TRIP steels, the last 20 years of steel type, are utilized in the vehicles.

The excellent mechanical properties of this steel grade generation are the result of multiphase microstructures. This multiphase microstructure comprises ferrite, bainite and residual austenite phases. The most important characteristic distinguishing this type of steel from other advanced steel types is the transformation of residual austenite into martensite under load. The combination of ductility and strength features is based on this attribution.

In this paper, the effects of intercritical annealing temperature on the hardness of steel materials in accordance with TRIP concept in different compositions was investigated. Two different sample groups were obtained from these steel specimens by critical annealing + rapid cooling and critical annealing + isothermal holding + cooling processes at bainitic temperatures. Microstructure and hardness formation are interpreted on these samples. By this way, to enrich of the TRIP knowledge concept is aimed.

Keywords: Intercritical Annealing Temperature, Isothermal Holding, TRIP Steels, Residual Austenite, Bainitic Temperatures

DIAGNOSIS OF DIABET DISEASE BY USING DIFFERENT MACHINE LEARNING TECHNIQUES

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Abstract:

In today's world, diabetes is one of the most dangerous and most frequent diseases in the world that hits people's life. In the last few decades there have been developed many ways of predicting diabetes. This paper helps in predicting diabetes by applying data mining techniques and some machine learning algorithms. The aim of data mining is to extract knowledge from information stored in dataset and generate clear and understandable description of patterns. Since diabetes is mayor disease in people's life, in this paper it has been given effort to improve prediction of diabetes using a population of woman who were at least 21 year old of Pima Indian heritage living in Phoenix. In this research, Python with Anaconda3 was used to implement Naïve Bayes, Logistic Regression and Random Forest to classify our dataset and tried to do as more as it is possible to predict and improve prediction for this very important field in medicine and help people to do something in order to prevent or decrease the chance of getting diabetes.

Keywords: Pima Indian Dataset, Diabetes, Classification, Logistic Regression, Naïve Bayes, Random Forest

NEOANTIGEN BASED IMMUNOTHERAPY IN PERSONALIZED CANCER TREATMENT

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Abstract:

Recent advances in sequencing technologies and personalized medicine enable new approaches in cancer treatment by utilizing immune system. One of these applications is the vaccination with tumor-specific antigens so called neoantigens, described by peptides containing amino acid substitutions caused by nonsynonymous mutations. The biggest advantage of neoantigens is that they are not subjected to immune tolerance. Groundbreaking studies demonstrate in vitro and in vivo success for T cell response and tumor eradication. Despite of the success of the human vaccination based on neoantigens, they need to pass clinical trials and regulatory issues in order to be fully available in medical care. Moreover, they largely depend on sequencing technologies and computational analysis so with the improvement of these two components, neoantigen vaccination will also be improved. This review brings insight into current mechanism of neoantigen recognition and methods used to identify them. Another aim of this review is to emphasize the importance of research on neoantigens which might bring new era of cancer treatment.

Key words: Neoantigens, personalized medicine, tumor infiltrating lymphocytes, T cells, MHC complex

DETERMINATION OF HEAVY METAL TOXICITY OF CHROME TANNED AND ALUMINUM TANNED FINISHED LEATHER SOLID WASTE

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Abstract:

It is reported that 90% of all global production of tanned leathers is tanned using chromium sulfates. The remainder are tanned using other metal sulfates, mostly aluminium, vegetable tannins or a combination of both. However, the tanning process alone can not provide the characteristics and quality expected of finished leather. Therefore, tanned hides are tanned a second time with either the same metal sulfate as used in the tanning process or a different one. Except in some special situations, a lower ratio of metal salts is used in the secondary tanning process. During subsequent coloring and finishing processes, the leathers are treated with pigments and dyes containing heavy metals. The finished leathers are put through mechanical processes such as trimming before being passed on to the garment industry. These mechanical processes result in the generation of unusable solid waste. In order to determine the effects of heavy metals on biological systems, the MetPLATE method was used. This recent development allows quick evaluation and shows only heavy metal toxicity. This test is sensitive to several metals and has been used successfully in determining the metal toxicity of waste in various industrial sectors. In this study, the heavy metal concentrations of chromium tanned and finished tanned leathers were determined using ICP-OES; The toxicity of samples was investigated using the MetPLATE bioassay. While heavy metal concentration results of chrome tanned leather are heavy metal concentration results of aluminum tanned leather are 0 Sb, 0 As, 0 Cd, 0 Cr, 0 Cu, 0 Pb, 0 Hg, 0 Ni, 21033.45 Al, 70.54 Zn and 461.52 Zr. As a results; Chromium and aluminium were found to constitute 98% of the total concentration of heavy metals in finished leather tanned with chromium and aluminium salts. The average inhibition values for chromium and aluminium were 98.08% and 97.04%.

Keywords: Heavy Metals, Tanning, Leather, Metplate

INFLUENCE OF POURING TEMPERATURE ON THE FORMATION OF SPHEROIDAL AND LAMELLAR GRAPHITE IN CAST IRON

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Abstract:

The objective of this research is to investigate the effect of pouring temperature on the microstructure of the cast iron. The pattern was designed with 300 mm of width and the thickness variations are1.25 mm and poured at five different temperatures; 1300, 1325, 1350, 1375 and 1400oC. Several cast irons, prepared with different chemical compositions and microstructures (three lamellar and three spheroidal structures) have been examined by extensive mechanical testing and optical microscopy. The fluidity of spheroidal and lamellar graphite in cast iron increases with the pouring temperature. The numbers of nodules were decreased by increasing pouring temperature for spheroidal structures. Whereas, the numbers of flakes of lamellar structures changed by both pouring temperature and chemical composition. In general, with increasing pouring temperature, the amount of pearlite in the internal structure of both lamellar and spheroidal graphite cast iron materials were increased.

Keywords: Spheroidal Graphite Cast Iron, Lamellar Graphite In Cast Iron, Pouring Temperature, Tensile Test, Impact Test

INVESTIGATION OF THE FADING TIME EFFECTS ON MICROSTRUCTURE AND MECHANICAL PROPERTIES IN VERMICULAR CAST IRON

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Abstract:

In this study, the fading time affecting the mechanical properties and microstructures of vermicular cast iron were studied. Pig iron and steel scrap weighing about 12 kg were charged into the high frequency induction furnace crucible and completely melted for production of vermicular cast iron.The slag was skimmed using a common flux. After fading time was set at 1.3 and 5 minutes. In this way three vermicular cast iron was produced that same composition but different phase structures.The microstructure of specimens were investigated and uni-axial tensile test and the Charpy impact test were performed and their micro-hardness measurements were done in order to characterize the mechanical behaviours of vermicular cast iron.

Keywords: Vermicular Cast Iron, Fading Time, Hardness, Tensile Test, Impact Test

NEW APPROACHES TO THE PEPTID SYNTHESIS & CHARACTERIZATION

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Abstract:

The continuous technological developments increase the variety of the studies in the scientific field. Further, these improvements keep on to add knowledge and new explanation about to definitions, physiological functions, structures and sources of known and unknown many substances. Proteins and peptides play a central role in numerous physiological and biological processes in living organisms. Peptides are synthesized for a variety of applications and research interests. For peptide synthesis applications; Library synthesis sequence, peptide synthesis for biological or separation assays, and separation of reaction conditions. One of the peptide synthesis methods is Solid Phase Peptide Synthesis (SPSS). Therefore in this work, it is take aimed to review new methods for synthesis and characterization of peptides and developments of peptide resins.

Keywords: Characterization, Peptide Synthesis, Resin, Solid Phase Peptide Synthesis

COMPARISION OF MECHANICAL AND THERMAL PROPERTIES OF DIFFERENT AGRICULTURAL PLASTIC MULCH FILMS

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Abstract:

Mulch films are used to control the environmental conditions of plants such as temperature, moisture, growing weeds etc. In addition, mulch films enhance product yield of vegetables and fruits such as tomatoes, peppers and strawberries. These films are classfied as synthetic and biogedradable plastic materials. Biodegradable mulch films have some advantages because of mulch film degradation after harvesting and do not require cost of collection. Low density poly(ethylene) (LDPE) is used traditionally in agricultural mulch applications. They have varried with different colors such as white, black and grey or transparent ones according to climate conditions and plant. In this study, mechanical and thermal properties of synthetic mulch films produced from LDPE with different colors was determined and their performances were evaluated.

Keywords: Mulch, Biodegradable, Synthetic

USE OF QUICK COUPLINGS IN DESIGN OF WORK DIES

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Abstract:

Work dies are generally equipment with complete machine and equipment, enhance their function, enable integrity of measurement and location and ease the production and make it possible for a work to be carried out more easily and effectively. In this study a clamping work dies was designed by using quick couplings in bonding plastic or metal plates with friction stir welding (FSW) in high-speed CNC machine. In the design specific criteria were considered such as input-output direction of welding set, shoulder width measurement, equal distribution of the pressure applied on metals, light and portable dies, rapid assemble and disassemble of the plates. With the designed work dies, friction stir welding practices were done on Poly ethylene (PE) plates for trial. It was observed that the work dies which was created as a result of design is compatible with its aim and with what was expected at the beginning of design and can be used successfully in friction stir welding practices. Especially in automotive industry, fixtures are used for serial welding of equipment whose assembling is difficult and complex. It was determined that quick couplings which are used in the design would provide us convenience and practicability fort hey can be used together with both work dies and fixtures in such practices.

Keywords: Work Dies, Manufacturing, Welding, Quick Couplings, Automotive Industry

C&D WASTE MANAGEMENT IN TURKEY

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Abstract:

Migrations from rural areas to cities has been increasing in many parts of the world, especially in developing countries. This situation has led to an increase in construction, demolition and renovation works. Today, around 50% of the consumed products and 45% of generated solid wastes are related to the construction sector. Turkey has initiated urban transformation activities around the country with the law promulgated in 2012 and amount of C&D waste has been growth rapidly. The purpose of this study is present current C&D management system in Turkey. In this context; first definition and type of C&D wastes are given. Then, information about amount of C&D waste collected is given and some estimations were done when they were necessary. C&D waste management methods are explained and finally C&D waste management in Turkey is evaluated. C&D waste management regulations prepared by Ministry of Environment and Urbanisation and practice by city and district municipalities. Totally, 67 million ton C&D waste and excavation soil were produced only in Istanbul and according to estimations 130 million ton was produced across the country in 2013. It is expected that 150 million ton C&D waste and excavation soil will be produced in Istanbul in 2033. Currently reuse and recycling ratios are below the targets but with urban transformation activities and regulations they will increase.

Keywords: C&D Waste, Management, Recycling, Regulation.

DETERMINING THE WORK FLOW AND STANDARD UNIT TIMES OF A SHIRT PRODUCTION LINE

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Abstract:

It is difficult to determine the productivity of production units because of the complexity of operations and the variability of operators. Therefore, certain techniques have been developed to collect necessary data and measure productivity. Time study is one of these techniques which is based establishing an actual allowed time standard for performing a given task, with due allowance for fatigue and for personal and unavoidable delays.

In this study, production flows are created for three different models produced in a shirt production band of an apparel factory where suits are produced. Then, time study is applied in shirt production band and the standard unit times of three different models are determined by dividing the operations into elements, watching the operator for several cycles and recording the time with a stopwatch. During the time study process, the number of observations' cycle is calculated statistically in order to compose an equitable standard. Owing to determined standard unit times, it is possible to estimate the due date of the future orders.

Keywords: Apparel Industry, Work Flow, Time Study, Productivity

RESEARCH OF MECHANICAL PROPERTIES OF POLY(LACTIC ACID) AND GREEN COMPOSITES

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Abstract:

Synthetic polymers are produced about 140 million tons per year in worldwide and pruduction of synthetic polymers have increased gradually. Synthetic polymers are resistant to microbial attack. Polyesters can be produced from plant, microorganisms, bio-derived monomers such as lactic acid. Biodegradable polymers are important because of environmental and economic concerns such as waste disposal and intensifying expenses of petroleum production. Polyesters play very active role as biodegradable plastics because of their hydrolyzable ester bonds. Poly(lactic acid) (PLA) is the most avaliable among polyester based biodegradable polymers. The production capacities of biodegradable plastics have been increased in every year. In this study, green composites were prepared with PLA, algae and zeolite at diffrent ratios by using high shear mixer with mode 11. Mechanical properties of green composites was investigated with tensile test machine (Zwick, 1kN). Thin comopsites films were observed with optical microscopy.

Keywords: Poly(Lactic Acid), Algae, Zeolite, Optical Microscopy

APPLICATION OF DIODE ARRAY DETECTION WITH A C30 REVERSE PHASE STATIONARY PHASE FOR THE SEPARATION AND IDENTIFICATION OF UNSATURATED FATTY ACIDS

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Abstract:

The aim of this study was to develop a stable and high-efficiency reverse phase HPLC method that would allow the effective separation and identification of cis/trans- isomers of long-chain fatty acids (FAs). The study also aimed to employ diode array detection (DAD) to determine chromatographic peak purity and to identify the FAs from their spectral characteristics. To achieve an excellent separation of FAs, the method parameters was optimized by using central composite design (CCD) and response surface methodology (RSM). In optimization study, we studied by using Develosil C30 column (25 cm×0.46 cm, 5 µm). Three experimental parameters were chosen as independent variables: mobile phase composition, flow rate of mobile phase and temperature of column compartment. A multivariate experimental design was used to establish a quadratic model as a functional relationship between the efficiency of chromatographic separation parameters and three independent variables. The significance of a polynomial model for predicting the optimal values of method parameters was evaluated. Three-dimensional RSM plots for the interactions between the variables were also constructed. The peak chromatographic factors were significantly affected by the %ACN content and column temperature. Regression analysis with R2 values showed good agreements between the experimental results and predicted values. Thus, by performing fewer experiments, CCD and RSM provide more information along with individual as well as interactive effect of all the experimental parameters involved in this study for a satisfactory separation of FAs. Furthermore, in terms of adequacy, accuracy and significance, the proposed application of DAD with a C30 reversed phase stationary phase, appeared to be comparable to gas chromatography applications.

Keywords: Optimization, Response Surface Methodology, Central Composite Face-Centered Design, Chromatograhy

LOOP BASED COLUMN-SWITCHING LC×LC SYSTEM COUPLE WITH EVAPORATIVE LIGHT SCATTERING DETECTOR FOR THE CHARACTERIZATION OF TRIGLYCERIDES IN REFINED COMMERCIAL EDIBLE OILS

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Abstract:

Two-dimensional liquid chromatography techiques have become an attractive analytical tool for the separation of complex compounds due to its enhanced selectivity, peak capacity, and resolution compared with one-dimensional liquid chromatography. In recent times, more attention has been drawn on the application of this chromatographic technique in studies concerning lipidic compounds. Herein, we have developed a novel loop based, column-switching LC×LC system couple with evaporative light scattering detector (ELSD) for the characterization of triglycerides in refined edible oils. In accordance with this purpose, automated column-switching system was designed and set up by modifying Agilent 1200 Series HPLC in our laboratory. This system consists two G1311A model quaternary pump, a G1328B model standard auto-sampler, G1316A model thermostatted column compartment, 385 model ELSD. To provide the desired flow path of the mobile phase in the system, two G4231A model 2-position/6-port valve systems and a G4232A model 2-position/10-port valve system were adapted. To hold the lipid fractions two flexible stainless steel loops were adapted onto the 2-position/10-port valve system. Inertsil Sil 100Å (50 and 250x4.6 mm i.d. 5 µm) and ChromSpher 5 Lipids silver ion columns (250×4.6 mm id., 5 µm) were used together in system. By using this system, a complete lipid profile of the vegetable oil samples was achieved in a very short time with a single injection. The operation of system could be carried out, by using five major steps/positions sequentially applied.

In this part, we report a loop based, column-switching LC×LC-ELSD method to characterize the triglyceride isomers in commercial refined sunflower, corn, olive, palm, canola and soybean edible oils, by using positions-I, II and III respectively. Obtained results showed that triglycerides in oil samples were well separated. Therefore, the proposed loop based and column-switching LC×LC method and instrumentation provide a powerful tool for characterization of triglycerides in refined oils.

Keywords: Column-Switching, LC×LC, Triglyceride, Refined Vegetable Oil, Evaporative Light Scattering Detector

A NOVEL COLORIMETRIC AND FLUORESCENT CHEMOSENSOR FOR PH IN ORGANO-AQUEOUS MEDIUM

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Abstract:

The detection of pH is crucial roles in the health science, industrial and agricultural process. Intracellular pH plays a significant role in modulation many metabolic process including cell growth, proliferantion, apoptosis, and ion transport systems. Abnormal pH values are caused many serious human diease such as Alheimer's disease and cancers. Therefore, the determination of irregular pH changes is very critical for diagnosis of diseases. Many methods for the detection of intracellular pH such as electrochemistry, absorbance and fluorescence spectroscopy. Among the process, fluorecent studies are suitable due to their low cost, real time detection, high selectivity and sensivity.

In this study, a 3-(3,5-bis(trifluoromethyl)-6,7-dihydroxy-2H-chromen-2-one was synthesized and characterizated. The behavior of receptor toward various cations were studied with using UV-Vis and fluorescence spectroscopy. The receptor displayed that a naked-eye detectable color change 257, 400nm and turn on fluorescent reponse in alkaline pH in comprison with the free chemosensor.

Keywords: Coumarin, Ph, Fluorescencent Chemosensor

PEROXIDASE-LIKE ACTIVITY OF APOFERRITIN PAIRED SILVER CLUSTERS AND ITS BIOMEMORY APPLICATIONS

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Abstract:

Ferritin, an iron storage and detoxification globular protein, is a nanoscale naturally. Ferritin composed of 24 homologous polypeptide subunits of the heavy chain (H-ferritin) and light chain (L-ferritin) with an eternal diameter of 12 nm and an 8 nm diameter cavity. Horse radish peroxidase (HRP) is a metalloenzyme, catalyzes the oxidation by hydrogen peroxide. Peroxidase activities of some nanoenzymes have been prepared such as ceria NPs, carbon NPs and Pt NPs. Bionanomaterials which have multi faces and functionalities (Janus) have synthesized using apoferritin biomolecules embedding of metal atoms into lattice of this protein. These bionanostructures have obtained using photosensitive amino acid-monomers linkage method (ANADOLUCA). In this study, the synthesis of nanoapoferritins has prepared in the presence of bis (2-2'-bipyridil) MATyr-MATyr-rutenyum (II) photosensitive monomers by microemulsion. Then, silver atoms have organised into lattices of apoferritin nanostructures and these multi functional structures were have characterised by transmission electron microscopy (TEM). Michaelis-Menten kinetics of Janus model bionanomaterials have proved with 3.3',5.5'-tetramethylbenzidine (TMB). The effect of pH, temperature and subsrate concentrations on the activity of these bionanomaterials have analyzed. Using cyclic voltammetry (CV) and chronoamperometry (CA) the memory function of the fabricated biodevice was validate

Keywords: Apoferritin, Biomemory, Bionanomaterials, Peroxidase

TEXTURAL PARAMETERS AND ULTRASTRUCTURAL CHANGES OF AMASYA APPLES BY APPLIED WITH OSMOTIC DEHYDRATION PRETREATMENT

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Abstract:

The aim of present study is to analyse the effect of osmotic dehydration pretreatment applied to Amasya apples on the textural parameters and ultrastructural changes of this fruits. For this purpose, at the end of time periods as 0, 60, 120, 240, 360 and 480 minutes of 8 hours immersion time, the effect of 25%, 45%, 55% and 65% sucrose concentrations and 25°C, 35°C and 45°C immersion temperatures on apple cubes has been studied. The results have been evaluated by analyzing on scanning electron microscope with the aim of determining microscopic structure changes and by using Texture Profile Analyser textural characteristics.

During the osmotic dehydration process as associated with water loss and solid gain parameters, the increase in adhesiveness, cohesiveness and elasticity values has been determined while there has been the decrease in textural values such as hardness, springeness, gummines, and chewiness in texture profile analysis of fruit samples. It has been determined that there are ultrastructural changes generally such as collapse and shrinkage in the cells, contraction in the intracellular spaces, deformation in the cell's walls and largening in intercellular spaces when microscopic structure of fruit samples having osmotic dehydration process by scanning electron microscope has been examined.

Consequently, the hardness is one of the most important parameters in fruits. During the osmotic dehydration, it has been identified that the hardness values of apple samples increasingly decreased along with an increased in solution concentration and process temperature. This decreased has been explained with water loss which occured in osmotic dehydration and therefore turgor pressure diminished in the cells. Because the differences where in microscopic structure of apple samples arised from in cells and intercellular spaces, it has been determined that ultrastructural changes and textural characteristics are related each other.

Keywords: Amasya Apple, Osmotic Dehydration, Texture Profile Analysis, Microscopic Structure.

THE EFFECT OF OSMOTIC DEHYDRATION PRETREATMENT APPLIED TO APPLES ON THE QUALITY PARAMETERS OF THIS FRUITS AND KINETIC MODELING

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Abstract:

The aim of present study is to analyse the effect of osmotic dehydration pretreatment applied to apples on the quality parameters of this fruits and kinetic modeling. For this purpose, at the end of time periods as 0, 60, 120, 240, 360 and 480 minutes of 8 hours immersion time, the effect of 25%, 45%, 55% and 65% sucrose concentrations and 25 °C, 35 °C and 45°C immersion temperatures on apple cubes has been studied. Mass transfer mechanisms have been modeled by calculating kinetic parameters such as water loss, solid gain and weight decrease of samples. Besides, the results have been evaluated with the analyses of water activity value, colour and rehydration rate.

During the osmotic dehydration process as associated with water loss and solid gain parameters. L* colour values of fruits have decreased compared to fresh samples, however this decrease has less in high sucrose concentrations. It has been remarked b* colour values of fruits have increased during osmotic process. When It has determined that fruit samples with osmotic process have had less rehydration rate than non-processed samples, this rate has been measured as 4.84 in apple. It has been determined that P% values of samples except 25% sucrose concentrations are low and emprical results are very suitable to the model when Azuara et al. (1992) and Hawkes and Flink (1978) mass transfer models have been analysed in order to carry out the equilibrium water loss and equilibrium solid gain values. Equilibrium water loss values of apple samples have been obtained at 45Co in 65% sucrose concentration as 75.18%

It has been conclusion that the osmotic dehydration process have a positive effect on quality values and kinetic parameters of apple samples.

Keywords: Osmotic Dehydration, Mass Transfer, Modeling, Texture, Apple

PREPARATION AND PROPERTIES OF CONTROLLED-RELEASE FERTILIZERS COATED WITH CROSSLINKED HYDROGELS

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Abstract:

Controlled-release fertilizers (CRF) can be prepared by encapsulation of fertilzers with water-insoluble polymers currently has popular usage and offer great advantages. Solubility characteristics of coated fertilizer in the soil is most important factor for releasing behaviour. In this study urea based granule shaped fertilizer samples were coated with aqueous poly(vinyl alcohol) (PVA) solutions containing DMSO via crosslinking with using various ratio of glutaraldehyde as crosslinker. Coating process was carried out in a rotary drum and polymer solutions were sprayed on the granules. Coating thickness of fertilizers were determined by optical microscopy method. In order to understand the release behaviour of CRFs with encapsulated, samples were tested in the water. With using spectrophotometer concentration of urea was calculated for samples in the water. Consequently, desired coating thickness, surface properties and release behaviour were reached. Releasing of urea takes longer time was observed with increasing cross-linking ratio.

Keywords: Controlled-Release Fertilizer, Urea Fertilizer (EUF), Polymer-Coated Fertilizer, Crosslinked Polyvinyl Alcohol (PVA)

INVESTIGATION OF JET-STRIP AND PRODUCTION CYLINDER SURFACES USED IN THE PRODUCTION OF NONWOVEN FABRICS IN CROSS-LAID LINE WITH HYDRO-ENTANGLEMENT TECHNOLOGY

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Abstract:

In this study, 100% PES nonwoven fabric production was made by changing the machine settings such as using flat patterned cylinders and micro porous shell (MPS) cylinders. The tensile strength, elongation at break and water absorbance values of the produced fabrics were measured. On the machine, the power of the pump and the cycle of the pump were observed. As a result of the measurements made, increase in the fabric strengths, decrease in the water absorption values, the pump cycle, and the pump power consumption were observed. As a result of these tests, a considerable energy saving has been achieved. In other experiments, different jet-stripes and different pressures have been tried in the production of nonwoven fabrics, which had different patterns and were made of different fibres with different ratios. On the fabrics, tensile strength, elongation at break, water absorption values were measured. As a result of the measurements, it was seen that the fabric strength values were increased and the water absorption values were changed based on the fibre blend ratios. These results mean that higher strength values of nonwoven fabrics can be obtained with using less energy; in other words remarkable results have been obtained in terms of nonwoven fabric production.

Keywords: Nonwoven Fabric, PES, MPS Cylinder, Energy Saving, Hydro-Entanglement, Cross Laid Line.

SURFACE PLASMON RESONANCE BASED ON MOLECULAR IMPRINTED SENSOR FOR MELAMINE DETECTION

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Abstract:

Melamine is used primarily in the synthesis of melamine formaldehyde resins for manufacturing laminates, plastics, coatings, commercial filters, glues or adhesives, dishware, and kitchenware. It has been illegally added to dairy products to obtain high readings of total nitrogen content as the false measurement of protein level [2,3]. In this report, we developed surface plasmon resonance (SPR) sensor [3] for the sensitive determination of melamine (MEL) in milk sample. Firstly, the modification of gold surface of SPR chip was performed by allyl mercaptane. Then, MEL-imprinted poly(2-hydroxyethyl methacrylate–methacryloylamidoglutamic acid) [p(HEMAGA)] nanofilm was generated on the allyl mercaptane modified gold surface. The unmodified and imprinted surfaces were characterized by fourier transform infrared (FTIR) spectroscopy, ellipsometry and contact angle measurements. The developed method was validated according to the ICH guideline. The linearity range and the detection limit were obtained as 0.1 – 1.0 ng/mL and 0.030 ng/mL, respectively. The developed imprinted nanosensor was applied to the milksamples for the determination of MEL. In addition, isotherm models were applied to data to explain adsorption process.

Keywords: Melamine; SPR; Molecular Imprinting

SYNTHESIS OF POLYOXOMETALATE/MULTI-WALLED CARBON NANOTUBES HYBRID AND APPLICATION FOR RUTIN DETECTION

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Abstract:

Flavonoids are polyphenolic compounds and constitute a significant part of the human diet. The antioxidant and anti-inflammatory properties of these compounds are indicated [1]. Rutin belongs to the flavonoid family that is distributed in fruits and vegetables. Carbon nanotubes are expected to play a significant role in the design and manufacture of many nano-material devices in the future. Carbon nanotubes exhibit many unique properties which generate strong interests in studying their applications [2]. Polyoxometalates (POMs) are highly redox-active material with great potential for electrochemical sensors. Due to their chemical versatility and stability, they can be utilized in catalysis, energy studies, and nano-electronics [3]. The prepared surfaces were characterized by electrochemical impedance spectroscopy (EIS) and scanning electron microscope (SEM). The developed electrochemical sensor was also applied for the determination of rutin in food sample and the linearity range of rutin was 1.0×10-8 - 1.0×10-5 M with the detection limit of 2.0×10-9 M.

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Keywords: Rutin; Nanocomposite; Detection

MICROSTRUCTURAL EVALUATION OF T6-TREATED A380 ALLOY MANUFACTURED BY SEMI-SOLID METAL CASTING

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Abstract:

Semi-solid metal (SSM) processes have been widely used in aluminum production as an alternative to conventional casting methods for many years. It is possible to obtain uniform non-dendritic microstructure with less porosity by using SSM techniques. Low superheat casting (LSC) is a kind of SSM method that operates at just above the liquidus temperature of subjected alloy. This method causes equiaxed grain formation instead of dendrites due to the combination of low heat input and rapid cooling. Reheating after LSC process provides transformation of equiaxed grains into spherical particles. In this study, A380 aluminum alloy was poured at 615°C in LSC technique and non-dendritic formation was achieved. Samples were reheated at a semi-solid temperature of 575°C after LSC and held there for varied times from 20 to 80 min. After reheating part, specimens were solution treated at 520°C, quenched and artificial aged at 180°C. Image analyser assisted optical microscopy and Brinell hardness test equipment were used to determine microstructural evaluation and related mechanical behavior of A380 alloy. It was concluded that spherisation of α-Al grains was increased with increasing reheating time and T6 heat treatment process leads to improve hardness by newly formed precipitates.

Keywords: Low Superheat Casting, A380 Alloy, Aluminum, Aging

CORROSION, MECHANICAL AND MICROSTRUCTURAL CHARACTERISTICS OF MODIFIED NAVY G BRONZE CASTS

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Abstract:

High tin bronze alloys have been widely applied in various fields including marine industry due to their high strength, good wear properties and good corrosion resistance. In this study modified navy g bronze was cast via conventional sand mould casting (SMC) technique. Chemical composition of the alloy was determined with optical emission spectroscopy. Mechanical properties were investigated through Brinell hardness, tensile and Charpy impact tests. Also the microstructure of the specimen was examined with optical microscope and energy-dispersive X-ray spectroscopy in order to better understanding of related properties. Corrosion tests were conducted by immersion of the specimens in three different media (0.5 M HCl, 0.5 M H2SO4 and 3,5% NaCl solutions) and carried out according to ASTM G1 – 03. Whole collected results were evaluated by comparing with the properties of other standardized materials in the industry.

Keywords: Navy G Bronze, Sand Mould Casting, Mechanical Characterization, Corrosion Testing

ELECTROCHEMICAL SENSOR VIA GRAPHENE QUANTUM DOTS FOR DETERMINATION OF ASCORBIC ACID

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Abstract:

Ascorbic acid is an important vitamin and the insufficient intake shows symptoms of scurvy [1]. Graphene/graphene oxide has been crucial material in sensor technology because of its catalytic effect. Graphene quantum dots (GQDs) are smaller than graphene sheets. The edge properties of GQDs cause effective surface area and high electrochemical effect [2,3]. GQDs are also single atomic layer as graphite. Therefore, the studies about GQDs in chemistry and nanotechnology have increased recently. In this study, a simple electrochemical sensor has been developed on GQDs. The developed surfaces characterized by scanning electron microscope (SEM) and electrochemical impedance spectroscopy (EIS).The glassy carbon electrode (GCE) modified with GQDs was applied to the determination of ascorbic acid in food sample.

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Keywords: Ascorbic Acid; Graphene Quantum Dots; Electrochemical Sensor

SENSITIVE DETERMINATION OF L-TYROSINE BASED ON GRAPHENE OXIDE NANOMATERIAL

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Abstract:

L-tyrosine (L-Tyr) is also a kind of important amino acid and maintain nutritional balance. The lack of L-Tyr causes depression, and other psychological diseases. However an overdose of L-Tyr results in chromatid exchange [1,2]. In this study, an electrochemical sensor based on graphene oxide (GO) modified glassy carbon electrode (GCE) was presented for determination of L-Tyr [3]. The prepared surfaces and nanomaterials were characterized by transmission electron microscopy (TEM), electrochemical impedance spectroscopy (EIS) and cyclic voltammetry (CV). The electrochemical determination of L-Tyr was performed by square wave voltammetry (SWV) with GO nanocomposite (GO/GCE). The developed electrochemical sensor was also applied for the determination of L-Tyr in spiked serum sample and the linearity range of L-Tyr was 1.0×10-9 - 1.0×10-7 M with the detection limit of 1.5×10-10 M.

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Keywords: L-Tyrosine; Electrochemistry; Graphene Oxide

A NOVEL DETERMINATION OF L-TRYPTOPHAN VIA AU@AG NANOPARTICLES ON POLYOXOMETALATE

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Abstract:

L-tryptophan (L-trp) is one of the most important amino acids which are used in the food industry as an antioxidant for several biological reactions [1]. L-trp is not synthesized in humans and other animals. Especially, core-shell nanoparticles are developed for the sensor technology [2]. Polyoxometalates (POMs) are highly redox-active material with great potential for electrochemical sensors. Due to their chemical versatility and stability, they can be utilized in catalysis, energy studies, and nano-electronics. In reduced forms, their electron and proton transfer make them act as efficient donors or acceptors [3]. In this work, a voltammetric sensor based on glassy carbon electrode (GCE) modified with gold@silver nanoparticles (Au@Ag) involved in a polyoxometalate (H3PW12O40, POM) is prepared for the determination of L-trp. The preparation and characterization of core-shell nanoparticles involved in a polyoxometalate are performed. Then, the developed sensors are applied to milk samples and the linearity range of L-Trp is 1.0×10-10 - 1.0×10-8 M with the detection limit of 2.0×10-11 M.

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Keywords: L-Tryptophan; Milk Sample; Polyoxometalate; Electrochemical Sensor

DEVELOPMENT OF NOVEL MOLECULAR IMPRINTED ELECTROCHEMICAL SENSOR BASED ON POLYOXOMETALATE/CARBON NITRIDE NANOTUBES NANOCOMPOSITE FOR DETERMINATION OF QUERCETIN

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Abstract:

Quercetin belongs to the flavonoid family that is distributed widely in fruits and vegetables. It has antiviral, anti-cancer, anti-inflammatory, anti-allergic and anti-tumor activity and antioxidant properties [1]. Carbon nitrides are a class of polymeric materials consisting mainly of carbon and nitrogen. They can be obtained from carbon materials with substitution of the carbon atoms by nitrogen [2]. Graphitic carbon nitride (g-C3N4) is prepared as an effective organic semiconductor catalyst. Polyoxometalates (POMs) are highly redox-active molecular components with great potential for electrochemical energy storage and sensors. Because POMs are a class of anionic metal oxides based on high-valent transition metals, the structure and reactivity of POMs is significant over a wide range [3]. In this report, a novel molecular imprinted voltammetric sensor based on glassy carbon electrode (GCE) modified with polyoxometalate ($H_3PW_{12}O_{40}$, POM) functionalized carbon nitride nanotubes was prepared for the determination of quercetin in orange juice. The developed molecular imprinted voltammetric sensor was characterized by using x-ray photoelectron spectroscopy (XPS) and electrochemical impedance spectroscopy (EIS). Quercetin imprinted GCE was prepared via electropolymerization process of 100 mM phenol as monomer in the presence of phosphate buffer solution (pH 6.0) containing 25 mM quercetin. The linearity range and the detection limit of the method were calculated as 1.0×10-11 - 1.0×10-9 M and 1.0×10-12 M, respectively.

References

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Keywords: Quercetin; Carbon Nitride Nanotubes; Polyoxometalate; Electrochemical Sensor

COMPARISON OF WELDING METHODS FOR JOINING SIMILAR AND DISSIMILAR STAINLESS STEELS

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Abstract:

The effect of welding method and additional wire on the weld quality was investigated in this study. Samples were selected as three different groups: AISI 430 / AISI 430, SAF 2205 / SAF 2205 and AISI 430 / SAF 2205. Each group was welded with tungsten inert gas (TIG), metal inert gas (MIG) and laser beam welding methods. In welding processes, additional low C-containing L-type welding wires (ER 316L for TIG, ER 308L for MIG, ER 318L and ER 316L for laser beam) were used to prevent undesirable sigma phase and chromium carbide deposition in the weld zone of post-weld stainless steels. The mechanical properties of the welded specimens were determined by hardness, tensile and impact tests at room temperature while the microstructures of the weld seam and the heat affected zones (HAZ) were observed with an optical microscope. The highest tensile strength was obtained at SAF 2205 / SAF 2205 metal pair produced by laser beam welding using ER316L wire. The most prominent grain growth was occurred in the ferritic parts of TIG and MIG welded samples. Recrystallization effect was increased grain size due to heat input in HAZ. The grain size of laser welded samples was not significantly changed because heat input in laser beam welding was lower than other welding methods.

Keywords: Welding

CARBON NITRIDE NANOTUBES DECORATED WITH GRAPHENE QUANTUM DOTS AS MICROBIAL FUEL-CELL ELECTRODE

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Abstract:

In this study, carbon nitride nanotubes (C3N4 NTs) decorated with graphene quantum dots (GQDs) modified glassy carbon electrode (GCE) was developed for microbial fuel-cell electrode. The unique C3N4 NTs@GQDs nanohybrid was synthesized by hydrothermal treatment. The unique C3N4 NTs@GQDs nanohybrid was characterized by spectroscopic and electrochemical techniques. C3N4 NTs@GQDs enabled the catalytic reduction of oxygen at the cathode and the electron transfer to the anode. C3N4 NTs@GQDs electrode showed high current density and power density.

Keywords: Microbial Fuel Cell; Carbon Nitride Nanotubes; Graphene Quantum Dots

DEVELOPMENT OF MOLECULAR IMPRINTED POLYMER BASED QCM NANOSENSOR FOR DETERMINATION OF AMOXICILLIN

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Abstract:

In this report, we developed quartz crystal microbalance (QCM) sensor for the sensitive determination of amoxicillin (AMOX) in egg samples. Firstly, the modification of gold surface of QCM chip was performed by allyl mercaptane. Then, AMOX-imprinted poly(2-hydroxyethyl methacrylate–methacryloylamidoglutamic acid) [p(HEMAGA)] nanofilm was generated on the allyl mercaptane modified gold surface. The unmodified and imprinted surfaces were characterized by fourier transform infrared (FTIR) spectroscopy AND ellipsometry. The developed method was validated according to the ICH guideline. The linearity range and the detection limit were obtained as 0.1 – 1.0 ng/mL and 0.030 ng/mL, respectively. The developed imprinted nanosensor was applied to the egg samples for the determination of AMOX.

Keywords: QCM; Molecular Imprinting; Validation; Nanosensor

INFLUENCE OF SOLUTION HEAT TREATMENT AT 1180 C ON THE PROPERTIES OF 2.4879 ALLOY

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Abstract:

Nickel based alloys are widely used in high temperature applications because of their decent creep and fatigue strengths. In spite of higher microstructural stability of the Ni base alloys, physical and microstructural properties are going to change with usage in high temperature applications. In this study, effect of solution heat treatment at 1180 C on the properties of 2.4879 alloy is investigated. Also, effect of cooling conditions after the solution treatment is studied. Microstructural characterization was carried out by optical microscopy and SEM analysis. Also, mechanical properties of the specimens were determined with Vickers hardness test.

Keywords: 2.4879 Alloy, Heat Treatment, Microstructural Characterization

VARIATION OF MICROSTRUCTURE AND MECHANICAL PROPERTIES OF 2205 DUPLEX STAINLESS STEEL FOR DIFFERENT SOLUTION TREATMENT

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Abstract:

Duplex stainless steels (DSSs) have austenite and ferrite phases in equal amount and DSSs have both higher mechanical properties and corrosion resistance owing to duplex microstructure. In this study, microstructural and mechanical properties of AISI 2205 alloy after solution treatment at 1150 C with various time are investigated. After the solution treatment, mechanical and microstructural properties of DSSs can be alter, especially changes in austenite-ferrite phase ratio. Mechanical properties changes in austenite and ferrite phases are determined with Vickers hardness test. Moreover, microstructural characterization is carried out by optical microscopy and image analysis.

Keywords: Duplex Stainless Steel, Solution Treatment, Microstructural Properties

DETERMINING DISPERSING MEDIA IN THE INVERSE SUSPENSION POLYMERIZATION OF POLYACRYLIC ACID

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Abstract:

Superabsorbent polymers (SAPs) are slightly cross-linked, three-dimensional networks of flexible polymer chains that carry dissociated, ionic functional groups.

They are basically the materials that can absorb fluids of greater than 15 times their own dried weight, either under load or without load, such as water, electrolyte solution, synthetic urine, brines, biological fluids such. They are polymers which are characterized by hydrophilicity containing carboxylic acid, hydroxyl, amine groups and so on, insoluble in water, and are cross-linked polyelectrolytes.

Despite the increasing market growth of SAPs, their industrial production processes have not changed notably and it is mostly done by solution polymerization. In solution polymerization a monomer such as acrylic acid or acrylamide are polymerized in water using polymerizing additives. But high polymerization heat release, toughness of the gel make the manufacturing processes difficult. Thus this method require further processes such as gel preparation, drying, sizing, post reactions and therefore manufacturing processes take time and costs. Each step affects the final properties of SAP particles considerably. In inverse suspension polymerization processes, small droplets of aqueous monomer solution are dispersed into a second phase, usually aromatic or aliphatic hydrocarbon prior to polymerization. Low viscosity remains constant during polymerization process and this help removing heat from media easily. Parameters such as, dispersing media, phase ratio, initiator, cross linking agent, surface active agent should be selected carefully. Type of dispersing media is especially important because the other parameters mostly depend on it. But once these variables adjusted properly the suspension system will work unproblematic. In addition, final granular product will need fewer processes and be ready for packaging.

In our work we evaluated hexane, heptane, cyclohexane and dichlorobenzene as an organic dispersing media in the synthesizing polyacrylic acid and found that cyclohexane and dichlorobenzene are suitable among the selected solvents.

Keywords: Super Absorbent Polymers (Saps), Inverse Suspension Polymerization, Polyacrylic Acid, Dispersing Media.

NOVEL AMPEROMETRIC XANTHINE BIOSENSOR BASED ON XANTHINE OXIDASE IMMOBILIZED ON ELECTROCHEMICALLY POLYMERIZED 10-[4H-DITHIENO(3,2-B:2',3'-D)PYRROLE-4-YL]DECANE-1-AMINE FILM

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Abstract:

Polymeric conducting DTP derivatives are becoming visible as useful structures for both molecular and polymeric materials for the biosensor design. They have planar structures, fused ring systems, electron releasing groups and conjugation properties to increase the electron transfer rate in the enzyme based biosensors. Therefore, these properties make them very important for overcoming the difficulty of the direct electron transfer between enzyme and the electrode [1-2] In recent years, in this area, the dithieno (3,2-b:2/,3/-d)pyrrole (DTP) moiety received much attention. The synthesis of DTP type conducting polymers is very important due to thiophene-pyrrole-thiophene fused ring system. Meat and meat products are currently one of the most important component of a healthy and well balanced diet due to its nutritional richness. Xanthine is an intermediate of the purine nucleotide and deoxynucleotide metabolism [3] and as the metabolic precursor of uric acid, it is the first indicator of an abnormal purine profile and can serve as a marker of various diseases as well in the food industry elevated levels of hypoxanthine and xanthine are important biomarkers as a sign of meat spoilage. In this paper, a novel amperometric xanthine (Xa) biosensor is constructed with immobilization of xanthine oxidase (XOx) on the pencil graphite electrode (PGE). Xanthine oxidase (XO) is immobilized on the electrochemicaly polymerized conducting polymer film with glutaraldehyde (GA). The xanthine detection is based on the xanthine consumed due to the enzymatic reaction involving xanthine oxidase. The effects of polymer thickness, applied potential, pH and temperature were investigated and optimum parameters were found to be 5 cycles, +5 V, 7.0 and 30 °C, respectively. The present xanthine biosensor with the high selectivity, sensitivity and stability is promising for practical applications.

Keywords: Amperometry, Xanthine Oxidase, Conducting Polymer, Biosensor

RAPID SURFACE HARDENING OF AISI 1045 STEEL FOR AUTOMOTIVE APPLICATION BY ELECTROLYTIC PLASMA TREATMENT

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Abstract:

For low carbon steels surface performance, carburization is often used to improve the surface properties. If the carbon content of steel is enough (C%4) thermal treatments such as induction, flame, laser, etc. can treated for surface hardening without the need for surface compositional change. This paper presents an experimental study of surface modification and rapid surface hardening on AISI 1045 steel by Electrolytic Plasma Treatment (EPT). Optimum voltage and ampere values were performed to obtain good surface properties. The surface morphology and the phase structure were analyzed with optic microscope, scanning electron microscope and energy-dispersive spectroscopy. The hardness of modified layer was investigated. It was found that the microhardness of the treated samples was much higher. The results show that, the hardness of AISI 1045 steel is approximately 210 HV0,1 and the hardness after EPT surface heat treatment is around 750-850 HV0,1.

Keywords: Surface Hardening, Phase Transformation, Steel, Microhardness

RESEARCH OF GROWTH MECHANISM OF MICRO ARC OXIDATION COATINGS ON MAGNESIUM ALLOYS

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Abstract:

Porous ceramics coatings were formed on magnesium substrates by micro arc oxidation (MAO) in glycerol phosphate calcium electrolyte for different times at the constant current and voltage. The MAO process and growth mechanism were investigated by scanning electron microscopy (SEM) and energy dispersive spectrometer (EDS), X-ray diffraction (XRD). The coating layer grows inward and outward at the same time in the initial stage, but outward growth of the coating is dominant later. Mg, Mg2SiO4 and MgO are the main phases of ceramic coating.

Keywords: Micro Arc Oxidation, Oxidation Time, Microstructure

INVESTIGATION OF MECHANICAL AND THERMAL PROPERTIES OF POLY(ETHYLENE)-POLY(LACTIC ACID) MULCH FILMS

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Abstract:

The usage of plastic mulch in agriculture has increased in the last years. Because of increasing benefits such as enhanced in soil temperature, enviromental and moisture control for plants. However, disposing of used conventional plastic films, which cause enviromental pollution. Therefore, photodegradable and biodegradable mulches have been developed. We can use polyolefin and biodegradable blends to produce agricultural mulch films. Low density polyethylene has been commonly used among conventional polymers. These mulch films are placed on the surface of the soil with machine or hand. These mulch films are prevent soil erosion, reduce weeding, protect soil moisture, and increase temperature of the soil. Biodegradable mulches are derived from plant starches and sugars. At the end of the season biodegradable mulches trigger to degradation by heat, light, microorganisms and other enviromental conditionals. In this study, biodegradable and non-biodegradable blends were prepared with polyethylene and poly(lactic acid) using blow film machine (GUlnar, twin screw diameter: 16 mm). Mechanical and termal properties of produced films were determined with tensile testing machine (Zwick 1 kN), DSC and TGA.

Reference

Subrahmaniyan Kasirajan & Mathieu Ngouajio, (2012), Polyethylene and biodegradable mulches for agricultural applications: a review, Agronomy for Sustainable Development April 2012, Volume 32, Issue 2, pp 501–529.

Keywords: Biodegradable, Recycling, Poly(Ethylene), Poly(Lactic Acid), Mulch

PREPARATION AND PROPERTIES OF POLYPHENYL ETHERS CONTAINING MULTIPLE BONDS IN THE MAIN CHAIN

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Abstract:

Polyphenyl ethers (PPE) are an important family of polymers known for their high thermo-oxidative strength properties. In addition, PPEs often work in extreme applications such as aircraft-space applications due to their superior resistance to radiation. Multiple bonds are real attraction point from the standpoint of differentiation of the molecule it enters into, its ability to modify and function in the desired direction. In the study, it is aimed to reveal the structure-property relationship of polyphenyl ethers containing multiple bonds in the main chain.

Recently, the Glaser coupling reaction between alkyne and alkyne groups has been widely used in organic and polymer chemistry. Glaser coupling reactions can be carried out under mild conditions need no oxygen removal and heating procedures makes the copper-catalyzed alkynyl homocoupling cyclization a valuable method for the preparation of cyclic polymers. Glaser coupling can be used as a clean and efficient method for combining and obtaining polymers. Omission of copper is advantageous to suppress Glaser-type coupling of the alkynes as side reaction. In this study the intramolecular cyclization was performed by Glaser coupling reaction in THF/Cu(I)Br/pentamethyldiethylenetriamine system at room temperature and under an air atmosphere. Structural, thermal and physical properties of obtained polyphenyl ether samples were investigated.

Keywords: Glaser Coupling, Polyphenyl Ether, Multiple Bonds

INVESTIGATION OF THE EFFECTS OF DIFFERENT CHEMICAL STRUCTURES ON THE COLOR OF THE SOFTENERS USED IN THE FINISH

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Abstract:

In textile, finishing are performed after bleaching, painting or printing. During finishing operations; attention must be paid to the extent to which the chemical constituents of the materials used influence the color of the dyed product. Purpose of this study; it has been investigated to what extent the dyed fabric sample of finishing chemistry with different chemical structure and different ionic character influences the color. In this study; softeners with four different chemical structure and finishing chemicals with three different ionic characters were used. Softeners with different ionic character and different chemical structure are diluted with water at a certain ratio and adjusted to pH 5-5.5 with acetic acid. The softeners were applied at three different concentrations and at two different drying temperatures according to the method of impregnation with 30/1 suprem. After the applications; untreated fabric was accepted as the standard and color measurement on the spectrophotometer. While the cationic (aminofunctional silicone) and nonionic (polyethylene and macro-micro silicone emulsion) characteristic softener concentrations are constant. As the drying temperature increased after application, it was observed that the fabric samples color was opened. When the drying temperature is constant; as the finish chemical concentration increases, the fabric samples become darker. In softeners with weak cationic character; when the drying temperature is held constant (at 130 ° C), the color of the fabric samples is increased as the softener concentration increases.

Keywords: Finishing, Softener, Chemical Structure, Ionic Character

BIOLOGICAL EFFECTS OF ARTIFICIAL LIGHTING

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Abstract:

Artificial lighting has been a phenomenon that has been used against the darkness since the time of mankind, even though it has followed different methods over time. Illumination has gained a new dimension for humans and some animals, as it is necessary to work at night with industrialization and population growth. Artificial lighting has begun to be used because of the necessity of the sunset of the sun, which is the natural illuminator of our planet. Like other living creatures in the world, man is a living creature that lives by the sun. In this work, will give information about artificial lighting how they affect people and chicken, sheep, mouse, etc. some animals. Also will be commented on future works.

Keywords: Lighting, Circadian Rythm, Illumination, Biological Effect

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