ICETI

ENGINEERING TECHNOLOGY INNOVATION

II INTERNATIONAL CONFERENCE ON ENGINEERING TECHNOLOGY AND INNOVATION

BOOK OF ABSTRACTS 2018

www.iceti.org

March 07-11 2018 Budapest Hungary

ISBN: 978-605-67955-0-3

Organized by

Partners

II INTERNATIONAL CONFERENCE ON ENGINEERING TECHNOLOGY AND INNOVATION

ISBN 978-605-67955-0-3

II BOOK OF ABSTRACTS OF THE INTERNATIONAL CONFERENCE ON ENGINEERING TECHNOLOGY AND INNOVATION 07-11 MARCH PUDAPEST

Edited by
Prof. Dr. Özer Çınar

Published, 2018

info@iceti.org
www.iceti.org

SCIENTIFIC COMMITTEE

1. Prof. Dr. Adisa Parić - University of Sarajevo - Bosnia and Herzegovina
2. Prof. Dr. Aleksandar Dimitrov - Ss. Cyril and Methodius University - Macedonia
3. Prof. Dr. Anita Grozdanov - Ss. Cyril and Methodius University - Macedonia
4. Prof. Dr. Asif Šabanović – International University of Sarajevo - Bosnia and Herzegovina
5. Prof. Dr. Christos Douligeris - University of Erlangen-Nurnberg - Germany
6. Prof. Dr. Dragutin T. Mihailović - University of Novi Sad - Serbia
7. Prof. Dr. Erkan Şahinkaya – İstanbul Medeniyet University - Turkey
8. Prof. Dr. Falko Dressler - University of Paderborn - Germany
9. Prof. Dr. Harry Miller – International University of Sarajevo - Bosnia and Herzegovina
10. Prof. Dr. Houssam Toutanji – Western Michigan University - USA
11. Prof. Dr. Ian F. Akyıldız – Georgia Institute of Technology - USA
12. Prof. Dr. İsmail Usta - Marmara University - Turkey
13. Prof. Dr. Liljana Gavrilovska - Ss Cyril and Methodius University - Macedonia
14. Prof. Dr. Lukman Thalib - Qatar University - Qatar
15. Prof. Dr. M. Asghar Fazel – University of Environment - Iran
16. Prof. Dr. Mehmet Akalin - Marmara University - Turkey
17. Prof. Dr. Mehmet Kitiş – Süleyman Demirel University - Turkey
18. Prof. Dr. Muammer Koç - Hamad bin Khalifa University - Qatar
19. Prof. Dr. Özer Çınar – Yıldız Technical University - Turkey
20. Prof. Dr. Perica Paunovik - Ss. Cyril and Methodius University - Macedonia
21. Prof. Dr. Rifat Škrijelj – University of Sarajevo - Bosnia and Herzegovina
22. Prof. Dr. Samir Đug - University of Sarajevo - Bosnia and Herzegovina
23. Prof. Dr. Tanju Karanfil – Clemson University - USA
24. Prof. Dr. Tibor Biro - National University of Public Service, Budapest - Hungary
25. Prof. Dr. Ümit Alver – Karadeniz Technical University - Turkey
26. Prof. Dr. Wolfgang Gerstacker - University of Erlangen-Nurnberg - Germany
27. Prof. Dr. Yılmaz Yıldırım - Bülent Ecevit University - Turkey
28. Prof. Dr. Yousef Haik - Hamad bin Khalifa University - Qatar
29. Assoc. Prof. Dr. Alaa Al Hawari - Qatar University - Qatar
30. Assoc. Prof. Dr. Izudin Dzafic - International University of Sarajevo - Bosnia and Herzegovina
31. Assoc. Prof. Dr. Muhamed Hadziabdic - International University of Sarajevo - Bosnia and Herzegovina
32. Assoc. Prof. Dr. Nusret Drešković - University of Sarajevo - Bosnia and Herzegovina
33. Assist. Prof. Dr. Faruk Berat Akçeşme - International University of Sarajevo - Bosnia and Herzegovina
34. Assist. Prof. Dr. Fouzi Tabet - German Biomass Research Center - Germany
35. Assist. Prof. Dr. Haris Gavranovic - International University of Sarajevo - Bosnia and Herzegovina
36. Assist. Prof. Dr. Murat Karakaya - Atılım University - Turkey
37. Assist. Prof. Dr. Sasan Rabieh - Shahid Beheshti University - Iran
38. Assist. Prof. Dr. Ševkija Okerić - University of Sarajevo - Bosnia and Herzegovina
39. Dr. Hasan Bora Usluer - Galatasaray University - Turkey
40. Dr. Muhammet Uzun - RWTH Aachen University - Germany
41. Dr. Zsolt Hetesi - National University of Public Service, Budapest - Hungary
42. Dr. Zsolt T. Németh - National University of Public Service, Budapest - Hungary

ORGANIZATION COMMITTEE

Chairman(s) of the Conference

Prof. Dr. Özer Çınar – Yıldız Technical University

Members of the Committee

Prof. Dr. M. Asghar Fazel – University of Environment - Iran
Prof. Dr. Ümit Alver - Karadeniz Technial University - Turkey
Assoc. Prof. Dr. Lukman Thalib - Qatar University - Qatar
Assoc. Prof. Dr. Nusret Drešković - University of Sarajevo - Bosnia and Herzegovina
Assist. Prof. Dr. Sasan Rabieh - Shahid Beheshti University - Iran
Alma Ligata - Zenith Group - Bosnia and Herzegovina

Ismet Uzun - Zenith Group - Bosnia and Herzegovina
Musa Kose - Zenith Group - Bosnia and Herzegovina

WELCOME TO ICETI 2018

On behalf of the organizing committee, we are pleased to announce that the International Conference On Engineering Technology And Innovation is held from March 07 to 11, 2018 in Budapest, Hungary.

ICETI 2018 provides an ideal academic platform for researchers to present the latest research findings and describe emerging technologies, and directions in Engineering Technology And Innovation. The conference seeks to contribute to presenting novel research results in all aspects of Engineering Technology And Innovation.

The conference aims to bring together leading academic scientists, researchers and research scholars to exchange and share their experiences and research results about all aspects of Engineering Technology And Innovation. It also provides the premier interdisciplinary forum for scientists, engineers, and practitioners to present their latest research results, ideas, developments, and applications in al lareas of Engineering Technology And Innovation. The conference will bring together leading academic scientists, researchers and scholars in the domain of interest from around the world. ICETI 2018 is the oncoming event of the successful conference series focusing on Engineering Technology And Innovation.

The International Conference on Engineering Technology and Innovation (ICETI 2018) aims to bring together leading academic scientists, researchers and research scholars to exchange and share their experiences and research results about all aspects of Engineering Technology and Innovation. It also provides the premier interdisciplinary forum for scientists, engineers, and practitioners to present their latest research results, ideas, developments, and applications in all areas of Engineering Technology and Innovation. The conference will bring together leading academic scientists, researchers and scholars in the domain of interest from around the world. The conference's goals are to provide a scientific forum for all international prestige scholars around the world and enable the interactive exchange of state-of-the-art knowledge. The conference will focus on evidence-based benefits proven in technology and innovation and engineering experiments.

Best regards,

Prof. Dr.Özer ÇINAR

Content

Al-10si-2cu Composites	
Effects On Hay Yield Of Common Vetch (Vicia Sativa L.) And Triticale (X Triticosecale Wittmack.) Mixture Rates In Bingol Conditions	**33.**
Determination Of Silage Potential And Nutritional Values Of Some Triticale Cultivars	**34.**
Effect Of Final Thicknesses On Mechanical Properties Of Hot Rolled Coil Products Made Of High Yield Strength Steels For Cold Forming	**35.**
Investigation Of Flavonol Transportation Mechanism By Using Polymer Inclusion Membrane	**36.**
Co-Pyrolysis Of Waste Tyres With Rice Husk In A Fixed Bed Batch Reactor	**37.**
Behavior Of Steel Wire Fibred High Performance Concrete Plates Under Loosely Clamped Boundary Conditions	**38.**
Investigation Of Microstructure And Mechanical, Corrosion Properties Of Aluminum Alloys Coated With Nickel-Copper Based Powder Aa5754 Through High Velocity Oxygen Fuel Powder Spraying Method (Hvof) When Combined Through Friction Stir Welding	**39.**
Microstructural Characterization And Heat Treatmenteffect On Photoluminescence Of Bata2o6:Sm3+Phosphor	**40.**
Effect Of The Additions Of Dehydrated Geopolymer Powders On Compressive Strength And Microstructure Of The Fine Alumina Powder Reinforced Na-Metakaolin Based Geopolymer Composite.	**41.**
Investigation Of The Reduction Rate Of Composite Pellets Containing Flue Dust And Mill Scales At Different Temperatures	**42.**
Extraction Of Vanadium And Zirconium From Red Mud With Acidic Leaching	**43.**
Hardware Based Face Matching System	**44.**
Hybrid Method For Reducing Illumination Effect In Face Recognition Systems	**45.**
Automatic Calculation Of Polarity Rates In Turkish Words	**46.**
Ufmc Transmission With Different Type Of Filters In Multipath Channel For 5g Networks	**47.**
Macro Nutrient Uptake Of Tall Fescue (Festuca Arundinacea) As Effected By Salt Stress	**48.**

Effects Of Various Fertilizers On Yield And Water Use Of Pumpkin Seed	49.
Investigating The Effect Of Parallelism On A Spark-Based Recommendation System	50.
Usage Of Natural Language Processing Techniques In Software Engineering Practices	51.
Applications Development For Easy Learning Of Geographical Information Systems	52.
A Novel Integrated Approach For Green Supplier Selection By Using Macbeth And Taguchi Loss Functions	53.
Cutting Force Prediction For End Milling Process	54.
Free Vibration Of Defected Cantilever Carbon Nanorod By Using Nonlocal Elasticity	55.
A Novel Planar Reconfigurable Microwave Filter Design	56.
An Investigation Of Injection Moulded Products Development	57.
Investigation Of Adsorption Of Oleic Acid From Sunflower Oil By Using Amberlyst 21 As An Adsorbent	58.
Evaluation Of A Novel Design For Improving The Mechanical Properties Of Carbon And Glass Fiber Reinforced Filament Wound Composite Tanks Exposed To Internal Pressures	59.
Optimization Of Mr Fluid Polishing Condition For Improving The Shape Accuracy Of Cover Glass Edge	60.
Application Of Maskless Lithography Process For Mems Probe Tip Fabrication	61.
The Properties Of Yarns Containing Recycle Polyester Fiber In Different Yarn Number	62.
Fabric Based Plain Heaters As An Innovative Approach For Vehicle Heating: A Theoretical Research On Comparative Performance	63.
Comparison Of Performances Of Parallel And Serial Connected Counter Flow Ranque-Hilsch Vortex Tubes System Experimentally	64.
Deformation Of Soil At Tunnel Construction	65.

Clustering Moodle User Data: A Case Study	**135.**
Impact Of Technology Based Learning Environment On Student Performance In A Civil Engineering Course	**136.**
The Determination Of Coastline Change Using Support Vector Machine In Berdan Dam Lake, Turkey	**137.**

SMART DIE CASTING FOUNDRY 4.0

Ali Serdar Vanli[a*], Anil Akdogan[a]

[a]Yildiz Technical University

*svanli@yildiz.edu.tr

Abstract:

A smart foundry, according to the definition of Industry 4.0, is a highly flexible production system that is able to produce small lot sizes and even single parts. To realize this, various tools and concepts need to be adapted. The use of modern information technology and the flexibilization of foundry machines and foundry processes is necessary to achieve this goal. If machine and process data are accessible without barriers, there are a lot of possibilities to link these and to carry out comprehensive optimization along the process chain of die casting. The logistics and processes of the foundry are thus transparent and can be tracked at any time. The point of consumption of energy and resources are visible, the material flows can be analyzed and optimized in detail. Complex interactions can also be deciphered and the entire system die-casting can be adjusted to an optimum operating point. To realize this vision are still some challenges to master. Within the framework of the research work, examples from the practice show potentials for the outlined vision, the "Smart Die Casting Foundry 4.0".

Keywords: Industry 4.0, Die Casting, Smart Foundry

*

3D IMAGING AND VISUALIZATION OF ENGINEERING MATERIALS WITH OPTICAL METROLOGY

Anil Akdogan[a], Ali Serdar Vanli[a*]

[a]Yildiz Technical University

*svanli@yildiz.edu.tr

Abstract:

Optical imaging and visualization base on classical optical techniques by using novel devices and instrumentation. Researchers can analyze structures, associated electronic systems, materials, specifications and manufacturing marks with help of optical systems. Innovative optical measurement devices and microscopes combine the speed and accuracy requirements of the researchers and industry. The invention of noncontact type techniques is in a sense due to the drawbacks of the contact type stylus measurement techniques. These non-contact measurement methods have unique ability to measure not only in laboratory conditions but also in-process of different types of materials like metals or polymers. This research is about the use of innovative optical techniques in 3D imaging and visualization of engineering materials performance analysis experimentally. In the conducted experiments the surface conditions of the brand new milling tool qualities are visualized. After milling operations at different process parameters, the worn mills were analyzed with optical metrology, as well. The results are profitable not only about life predictions of the tools but also useful for coating conditions of the work-piece surfaces.

Keywords: Optical Metrology, 3d Imaging, Visualization

*

INVESTIGATION QUALITY OF DURUM WHEAT GENOTYPES AND DETERMINATION OF THE PARENTS TO USE IN THE BREEDING PROGRAM

Enver Kendal[a*], Yusuf Dogan[a]

[a]Mardin Artuklu University

*enver21_1@hotmail.com

Abstract:

Genetic resources are crucial for the identification of parents and the enrichment of the gene pool that can be used in the development of new varieties for better nutrition of people. For this purpose, 9 promising line, 131 populations of landraces and 5 new varieties were used in the study. The experiment was set up in randomized blocks with 7 replications, according to the augmented (increased) experimental design in 2015-2016 growing season. In the study, we examined total nitrogen content, protein ratio, wheat color analysis (L* brightness, b* jaundice, a* redness) of 145 genotypes of durum wheat seeds. According to analysis of variance, highly significant differences ($P<0.05$ or $P<0.01$) were determined for total nitrogen, protein content and L* brightness, while were not significant for b* jaundice, a* redness. The superiority of the genotypes was determined by the first two principal components (IPC1 and IPC2) and to create a two-dimensional GGE biplot. The sum squares of the first two components were accounted by 45.34% (PC1) and 40.03%(PC2)for genotypes. The GGE biplot indicated that 9(nine) sectors occurred among genotypes and quality parameters. On the other hand, three groups occurred among the quality parameters based on the genotypes. The scatter plot demonstrated that there is high correlation between b* jaundice, a* redness. The results showed that cultivars and more landraces have general adaptability for all quality parameters, while some genotypes (79, 78, ..), (22,102,....), (3..) and 121, 5,...) showed specific adaptation for N, PC, L*, a* and b* respectively. According to the biplot techniques, G36 came forward with the N, P and a* and desirable landraces, G5 for b*, 30 stable line for all quality parameters, while (128, 61…) and majority of promising lines (L4, L6) came not forward with any quality parameters. The results of the study indicated that majority of landraces can be used as parents to improve the quality of durum wheat varieties. The study indicated that GGE biplot can be used to evaluate the genotypes as graphically to select the best genotypes for parents to use in breeding program.

Keywords: Durum Wheat Genotypes; GGE Biplot; Quality Parameters.

*

EXAMINATION QUALITY OF DURUM WHEAT LANDRACES AND SPECIFICATION OF THE PARENTS FOR GENE POOL OF TURKEY

Yusuf Dogan[a], Enver Kendal[a*]

[a]Mardin Artuklu University

*enver21_1@hotmail.com

Abstract:

Landraces are very important as genetic resources for identity of parents to improve gene pool and develop new quality varieties for better people's health. To this end, 131 populations of landraces (collected from Shout east of Anatolia Region) were used in the study. The experiment was set up in randomized blocks with 7 replications, according to the augmented (increased) experimental design in 2015-2016 growing season. In the study, we investigated total nitrogen content, protein ratio, wheat color analysis (L* brightness, b* jaundice, a* redness) of 131 genotypes of durum wheat landraces seeds. According to analysis of variance, highly significant differences ($P<0.05$ or $P<0.01$) were determined for total nitrogen, protein content and L* brightness, while were not significant for b* jaundice, a* redness. The superiority of the genotypes was determined by the first two principal components (IPC1 and IPC2) and to create a two-dimensional GGE biplot. The sum squares of the first two components were accounted by 46.50% (PC1) and 39.14%(PC2)for landraces. The GGE biplot indicated that 10 (ten) sectors occurred among landraces and quality parameters. On the other hand, three groups occurred among the quality parameters based on the landraces. The scatter plot showed that there is high correlation between b* jaundice, a* redness. The results demonstrated that majority landraces have general adaptability for quality parameters (N, PC, L*, a* and b*), while some landraces for only L*. (79, 78..), (22,102..), (3..) and 121, 5..) showed specific adaptation for N, PC, L*, a* and b* respectively. According to the biplot techniques, G36 came forward with the N, P and it was desirable a population, G5 for a* and b*, G30 was stable line for all quality parameters, while some landraces (49, 61 and 128, ..) were not related with any quality parameters. The results of the study indicated that majority of landraces can be saved as parents to improve the gene pool and release new quality durum wheat varieties. On the other hand, the study indicated that GGE biplot can be used to evaluate the landraces as graphically to select the best ones for parents of breeding program and contribute the gene pool.

Keywords: Landraces; GGE Biplot; Durum Wheat, Quality

*

THE RESEARCH ON QUALITY OF NEW DURUM WHEAT VARIETIES WITH GGE BIPLOT

Yusuf Dogan[a], Enver Kendal[a*]

[a]Mardin Artuklu University

*enverkendal@artuklu.edu.tr

Abstract:

Nowadays, quality of durum wheat is very important for healthy fed in Middle East countries, because majority of people are fed from durum wheat product (bulghur, macaroni, bread) Therefore, five (5) new durum wheat varieties which grown as common in Shout east of Anatolia Region were used in the study. The trial was set up in randomized blocks with 7 replications in 2015-2016 growing season. In the study, we searched total nitrogen content, protein ratio, wheat color analysis (L* brightness, b* jaundice, a* redness) of new durum wheat varieties seeds. The superiority of the varieties was determined by the first two principal components (IPC1 and IPC2) and to create a two-dimensional GGE biplot. The sum squares of the first two components were accounted by 65.27% (PC1) and 33.81% (PC2) for varieties. The GGE biplot showed that 4 (for) sectors occurred among varieties and quality parameters. Moreover, three groups occurred among the quality parameters (first group-a* and b*, second group-P and N, third group only L*) based on the varieties. The scatter plot showed that there is high correlation between both b* jaundice - a* redness and PC-N. The results indicated that Guneyyildizi variety was the best stable for quality parameters, while Sahinbey was desirable and Artuklu both undesirable and un stable varieties. According to the biplot techniques, Sahinbey came forward especially with the N and PC, Artuklu for a* and b*, Guneyyildizi, Hasanbey and Zuhre varieties for L*. The results of the study demonstrated that Sahinbey can be cultivated to improve all quality parameters, Guneyyildizi, to improve quality of bulghur and Artuklu, to improve quality of macaroni. On the other hand, the study indicated that GGE biplot can be used to evaluate the varieties as graphically to select the best ones and contribute quality of durum wheat industry.

Keywords: Durum Wheat Variety; GGE Biplot, Quality, Middle East.

*

EVALUATE OF PROMISING LINES OF DURUM WHEAT ON QUALITY WITH GGE BIPLOT

Yusuf Dogan[a], Enver Kendal[a*]

[a]Mardin Artuklu University

*enverkendal@Artuklu.Edu.Tr

Abstract:

Quality is very important for breeding program of durum wheat, because most people care to use the healthy-products (bulghur, macaroni, bread) of wheat). Therefore, in the study, nine (9) promising line were used. In the study, we examined total nitrogen content, protein ratio, wheat color analysis (L* brightness, b* jaundice, a* redness) of durum wheat promising lines seeds. The superiority of the varieties was determined by the first two principal components (IPC1 and IPC2) and to create a two-dimensional GGE biplot. The sum squares of the first two components were accounted by 59.83% (PC1) and 23.17% (PC2) for promising lines. The GGE biplot showed that 6 (six) sectors occurred among lines and quality parameters. Moreover, three groups occurred among the quality parameters (first group-N-P and a*, second group-only b*, third group only L*) based on the lines. The scatter plot showed that there is high correlation between both b* jaundice - a* redness and PC-N. The results indicated that L21, L22 and L23 were the best stable for all quality parameters, while L18 was desirable for L* and L16-L17 and L19 both undesirable and un stable. According to the biplot techniques, L21, L22 and L23 came forward for all quality parameters, L14 especially for PC and N, L13 for b* The results of the study demonstrated that L21, L22 and L23 can be candidate to release and improve quality parameters of durum wheat. On the other hand, the study indicated that GGE biplot can be used to evaluate the candidates as graphically to select the best ones and release as variety to contribute quality of durum wheat industry.

Keywords: Promising Lines,Durum Wheat GGE Biplot, Quality.

*

NUMERICAL SIMULATION OF SINGLE BUBBLE NUCLEATION FLOW BOILING BOTH FROM AN ARTIFICIAL CAVITY AND FROM A FLAT SURFACE AND POOL BOILING FROM A FLAT SURFACE IN HORIZONTAL CHANNEL

Mehmetcan Donertas[a*], Benjamin Franz[b], Axel Sielaff[b], Sabiha Yildiz[a], Peter Stephan[b]

[a]Yildiz Technical University,Department Of Mechanical Engineering,Energy Program
[b]Darmstadt Technical University Department Of Mechanical Engineering , Technical

*mmehmetcan786@gmail.com

Abstract:

In this study, Volume of Fluid (VOF) method in OpenFoam software is used to numerically simulate superheated FC-72 single bubble nucleation during flow boiling both from an artificial cavity and flat surface and single bubble nucleation during pool boiling from a flat surface.Semi implicit MULES algorithm were used in OpenFoam for the transport of VOF parameter. All simulations were performed in 3D. FC-72 was used as a working fluid and BaF2 was used for channel and cavity walls. The studies of the pool boiling on the flat surface were carried out on 0.01g 0.1g, 1g, 10g gravity magnitudes. The studies of flow boiling from a flat surface were conducted with 0.15 m/s, 0.3m/s, 0.6m/s velocity magnitudes on the constant 1g separately. In addition the first and the second studies which were conducted on 1g gravity magnitudes, were compared. It has been observed that the effect of gravity on the examined parameters reduced as a result of increasing velocity magnitudes. The studies of flow boiling from an artificial cavity were conducted for four different cavity depths on 1g gravity magnitude and with 10m/s flow velocity magnitude. Cavity diameters were defined as 30 micrometers for 3, 12, 25 and 50 micrometers cavities depths. In the studies with cavity depths 3 micrometers and 12 micrometers, the bubble completely detached from the cavity and after detachment no steam remained in the cavities. In the studies with the cavities depth 25 micrometers and 50 micrometers before bubble detachment, bubble took shape such as bottleneck and detachment occurs from this necks. After the detachment some vapor remained in the cavities and the second bubble started to grow. As a result gravity and velocity magnitudes and cavity depth have important effects on bubble growing period, detachment diameter, and detachment time.

Keywords: Single Bubble Flow Boiling, Flow Boiling In Horizontal Channel,Single Bubble Nucleation,Volume Of Fluid

*

HISTORICAL GEDIZ HOUSES: STRUCTURAL ANALYSIS OF THE BUILDING AND AN EXAMPLE OF THE RESTORATION WORK

Aylin Ozodabas[a*], Tugce Yuksel[a]

[a]Bilecik Seyh Edebali University

*aylin.ozodabas@bilecik.edu.tr

Abstract:

The architectural and structural aspects of the traditional Gediz houses in Kutahya province have been examined. The static situations were analyzed and interpreted by taking into account the work done by Kutahya Regional Directorate of Conservation of Cultural Assets. Kutahya Regional Directorate of Preservation of Cultural Heritage has decided that these historic houses should also serve as dwellings and restoration work have been done in this direction. Among the studies carried out in this study, one structure was taken up, survey and restitution work and restoration projects, pictures and information about the structure before and after restoration were given.

Keywords: Restoration, Restitution, Survey, Structure, Gediz Houses

[*]*Bilecik Seyh Edebali University*

SPECTROSCOPIC SURFACE INVESTIGATION OF LASER TREATED CFRPS TO ACHIEVE OPTIMUM ADHESIVE BONDING

Mustafa Ozgur Bora[a*], Belgin Genc Oztoprak[a], Erhan Akman[a], Onur Coban[a], Arif Demir[a]

[a]Kocaeli University

*ozgur_bora@yahoo.coom

Abstract:

Adhesive bonding of carbon fiber-reinforced plastics (CFRP) has number of advantages for joining of components when surface is prepared properly. If strong bond is to be achieved, there should be intermolecular and chemical interactions between CFRP surface and adhesive molecules depending on the chemical bonding theory. Laser surface treatment is a developing method in preparation the CFRP surfaces for adhesive bonding to provide reproducibly clean, slightly rough and preferably active surface. In the present study, lasers that emit radiation in different regions (UV and IR) of the electromagnetic spectrum were used to prepare the CFRP surfaces for the best adhesive bonding case. In order to determine both elemental and molecular properties of the surfaces, spectroscopy techniques such as laser induced breakdown spectroscopy (LIBS), X-ray photoelectron spectroscopy (XPS) and Fourier Transform Infrared Attenuated Total Reflection (FTIR-ATR) were performed. When the tensile test results were compared with spectroscopic data, it was seen that, an increase in the amount of oxygen and oxygen functional group on the laser treated CFRP surface improved the adhesion.

Keywords: Carbon Fiber Reinforced Plastics, Adhesive Bonding, Laser Surface Treatment, Libs, Xps, Ftir-Atr

[*]This work is supported by TUBITAK, "The Scientific and Technological Research Supporting Program 1001" contact number of 215M775

EFFECT OF MECHANICAL INTERLOCKING WITH VARIOUS MICRO HOLE FORMATIONS ON THE ADHESIVE BONDING STRENGTH OF CFRP/CFRP JOINTS

Mustafa Ozgur Bora[a*], Yalcin Erdogan[a], Erhan Akman[a], Onur Coban[a], Belgin Genc Oztoprak[a], Arif Demir[a]

[a]Kocaeli University

*ozgur_bora@yahoo.Coom

Abstract:

There are many different techniques to improve the adhesion between carbon fiber reinforced plastics (CFRP) which are used in aircraft primary structures. One of the most common techniques used today is the specific surface structuring of the joining partners in order to obtain mechanical interlocking. In this study, laser induced surface structuring effect on adhesion strength of CFRP/CFRP joints was investigated by single lap shear tests. Micro-holes were created by CO2 laser machine with different configurations in x and y axis for the best mechanical interlocking effect on the adhesive bonding. First of all, preliminary studies were done to investigate the effect of micro hole numbers (309, 625 and 914) on the adhesive strength of CFRP/CFRP joints according to ASTM D5868-01 standard with 60 kN DARTEC universal test machine. After determining the optimum micro hole number (309), the main part of the study was done according to micro hole formations (frame and box) on the adhesive bonding strength of the CFRP/CFRP joints. From single lap shear tests, it was determined that micro-hole structuring has significant effect on mechanical interlocking for adhesive bonding of CFRP/CFRP joints. Results showed that the shear strength of CFRP/CFRP joints gained maximum values with 309 micro holes and frame type micro hole formation. After mechanical tests, damage mechanisms were observed by using digital camera. It was found that fiber tear failure and cohesive failure were the dominant failure mechanisms.

Keywords: Carbon Fiber Reinforced Plastics, Adhesive Bonding, Laser Surface Treatment, Mechanical Interlocking

[*]This work is supported by TUBITAK, "The Scientific and Technological Research Supporting Program 1001" contact number of 215M775

EFFECTS OF THE LASER WAVELENGTH ON THE PRE-TREATMENT OF CARBON FIBER-REINFORCED PLASTICS FOR ADHESIVE JOINT

Onur Coban[a*], Yalcin Erdogan[a], Erhan Akman[a], Mustafa Ozgur Bora[a], Belgin Genc Oztoprak[a], Arif Demir[a]

[a]Kocaeli University

*onur_coban@yahoo.com

Abstract:

To improve the adhesive bonding performance of the carbon fiber-reinforced plastics (CFRP) pre-treatment is the indispensable process. In addition to many conventional methods, laser ablation has emerged as an alternative method because of the many advantages it provides during the pre-treatment of the CFRP surfaces. The ability to control the energy transferred to the material with laser with high precision, makes the lasers prominent in material processing. While the parameters such as wavelength, pulse duration, pulse energy, repetition rate provide energy control, it also causes differentiation in the ablation mechanism. In the study, pre-treatment of the CFRP surfaces were realized using two different laser wavelengths and the pulse durations. While, one of them is in the ultraviolet (UV) region and causes photo-chemical ablation, the other one is in the infrared region and causes photo-thermal ablation. After the surface treatment, adhesive strength of bonded CFRP samples was determined by single lap shear tests according to ASTM D5868-01. From test results, it is found that the ablation mechanism strongly affects the strength of adhesive bonding of CFRP.

Keywords: Carbon Fiber Reinforced Plastics, Adhesive Bonding, Laser Surface Treatment

[*]This work is supported by TUBITAK, "The Scientific and Technological Research Supporting Program 1001" contact number of 215M775

NOVEL SURFACE STRUCTURING OF CFRPS FOR ADHESIVE BONDING: EFFECT OF LASER INDUCED SCRIBE PATTERN ANGLE ON ADHESION STRENGTH

Onur Coban[a*], Erhan Akman[a], Mustafa Ozgur Bora[a], Belgin Genc Oztoprak[a], Arif Demir[a]

[a]Kocaeli University

*onur_coban@yahoo.com

Abstract:

Adhesive bonding of carbon fiber-reinforced plastics (CFRP) requires surface pre-treatment. In general; laser treatment is performed to clear the residues of release agents on the CFRPs. Additionally some studies dealt with the effect of laser ablation induced roughness on adhesion strength according to the mechanical adhesion mechanism. All these laser surface treatments focused on random surface roughening effect on adhesion strength. Therefore, in this study laser induced scribe patterns were regularly oriented with varied scribe angles (0°, 15°, 30°, 45°, 60°, 75° and 90°) on the CFRP samples to investigate its effect on mechanical interlocking mechanism in the adhesive bonding. Scribe patterned CFRP samples with various scribe angles have been adhesively bonded and then adhesive strength of bonded CFRP samples was determined by single lap shear tests according to ASTM D5868-01. After destructive tests, damaged surfaces were analyzed for the failure mechanisms with optical microscope. It is found that the strength of adhesive bonding depends on the laser induced scribe pattern angle from the test results. Additionally it is worthy to say that regularly oriented laser scribe patterns with a 45° angle leads maximum adhesion strength for CFRP bonding. This work was supported by TUBITAK, 'The Scientific and Technological Research Supporting Program 1001' under contact number [215M775].

Keywords: Carbon Fiber Reinforced Plastics, Adhesive Bonding, Laser Surface Treatment, Mechanical Interlocking

[*]This work is supported by TUBITAK, "The Scientific and Technological Research Supporting Program 1001" contact number of 215M775

COMPARISON OF THE MULTI LINE ANCHORED SYSTEM AND BORED PILE SYSTEM UNDER EARTHQUAKE EFFECT

Pinar Sezin Ozturk Kardogan[a*], Mehmet Inanc Onur[b]

[a]Gazi University
[b]Anadolu University

*sezinozturk@gazi.edu.tr

Abstract:

In the recent times, using the excavation support systems is very important role for deep excavations. In the excavation support system design, the multi line anchored systems and the fixed end moment pile supported systems are frequently preferred. In this study, behavior of the anchored supported systems and the fixed end moment pile supported systems is modelled under the seismic load. For this purpose; firstly, the depth of excavation is chosen as 15 meters and then, safe design parameters are determined both two system. The essential number of anchors and the length of anchors were calculated in the anchored supported systems. The diameter and length of pile in the fixed end moment pile supported systems are designated. Stresses and deformations were determined by the Plaxis program for both systems. After the static analyzes were completed, two ground motion records were used to understand the behavior of the supported systems under the seismic load by using Plaxis program. It has been observed that the multi line anchored system gives smaller displacements under earthquake loading.

Keywords: Deep Excavations, Earthquake Effects, Plaxis.

[*]*This study was supported under the 1705F331 project, which was accepted by Anadolu University Scientific Research Commision*

EFFECT OF REACTION CONDITIONS AND REACTOR TYPES ON THE USE OF INDUSTRIAL WASTES TO PREPARE CALCIUM CARBONATES FOR CO2 SEQUESTRATION BY AQUEOUS MINERAL CARBONATION PROCESS

Mahmut Altiner[a*]

[a]Cukurova University

*maltiner@cu.edu.tr

Abstract:

Industrial wastes have been used as a feedstock material for CO2 sequestration due to its chemical composition and carbon dioxide (CO2) gas is the one of the most important greenhouse gases that leads to an increase in the temperature of the world because of the increasing its concentration in the atmosphere. The mixture of industrial waste and CO2 to prepare calcium carbonate particles (PCC) at various experimental conditions can be good option for the capture of CO2. However, the morphological properties of PCC particles are strongly controlled by production parameters such as; temperature, stirring speed, solid-to-liquid ratio, use of solvent and additive, calcium concentration and etc.

Therefore, this study was used an aqueous mineral carbonation process to prepare synthetic calcium carbonate particles that is of highly demand in many industrial areas. Calcium carbide slag and desulfurization gypsum wastes were used as feedstock materials in this study. Two different types of mineral carbonation reactor were used. The effect of solid-to-liquid ratio, CO2 pressure, and reaction time on the production of PCC in detail was investigated. XRF, XRD, and SEM analyses were performed to evaluate the properties of each obtained PCC product. Each obtained PCC from calcium carbide slag was identified as calcite in all cases, whereas the mixture of vaterite and calcite crystals were obtained from desulfurization gypsum. The morphology of PCC were dependent on the production conditions. The study shows that the use of industrial waste not only can be called as an environmentally friendly but also provides a good option to prepare PCC with a high purity.

Keywords: Mineral Carbonation; Desulfurization Gpysum; Calcium Carbide Slag; Calcite; Vaterite

*

MECHANICAL PROPERTIES OF WOOD PLASTIC NANOCOMPOSITES REINFORCED WITH SEPIOLITE NANO FIBERS (SNFS)

Alperen Kaymakci[a*], Emre Birinci[a], Nadir Ayrlmis[b]

[a]Kastamonu University
[b]Istanbul University

*akaymakci@kastamonu.edu.tr

Abstract:

Effect of sepiolite nano fibers (SNFs) on some mechanical properties of wood polymer nanocomposites was investigated. To meet this objective, pine wood flour, polypropylene (PP) with coupling agent (MAPP), and SNF (0, 1, 3, 5, 7 wt%) were compounded in a twin screw co-rotating extruder. The mass ratio of the wood flour to PP was 50/50 (w/w) in all compounds. Test specimens were produced using injection molding machine from the pellets. The flexural and tensile properties of the wood polymer nanocomposites decreased with increasing with content of the SNFs (from 1 to 7 wt%) and MAPP (3 wt%).

Keywords: Wood, Plastic, Nano, Composites, Snf

*

PRODUCTION OF ACTIVATED CARBON FROM SPENT MUSHROOM COMPOST

Seyda Karadirek[a*], Hikmet Okkay[a]

[a]Yalova University

*seyda.karadirek@yalova.edu.tr

Abstract:

Activated carbon is a well-recognized porous material with high specific surface area and it has various utilization areas such as adsorbents, catalysts, catalyst supports, gases storage materials, electrodes etc. Activated carbon is usually obtained from fossil fuel generated hydrocarbons, renewable biomasses and wood or agricultural wastes by physical and chemical activation methods. Chemical activation is mostly preferred to physical activation because of various advantages such as lower process temperature, higher yield, cheaper production cost, higher specific surface area and single step process. The most important parameters of activated carbon production by chemical activation method are temperature, impregnant ratio, activation time, type of activating agent and precursor. The type of the precursor to be used in production process significantly effects the yield and specific surface area of the activated carbon. By the developing concern in the economical and efficient activated carbon production, new biomass wastes have been searching out as precursor for activated carbon production. In the present study, spent compost of oyster mushroom was chosen as a low cost, abundant and accessible precursor source. Also, no information has been given on the activation process of spent oyster mushroom compost. The main objective of the present work is to produce activated carbon from spent mushroom compost. In this study, we report the result of systematic study of the effects of activation temperature, impregnant ratio and activation time on the total production yield as well as on the methylene blue adsorption capacity of the activated carbons produced from spent mushroom compost.

Keywords: Activated Carbon, Spent Mushroom Compost, Methylene Blue Adsorption, Chemical Activation

*

COMPARISON OF COLOR VALUES OF POLYESTER FABRICS WOVEN FROM CONVANTIONAL AND MICROFILAMENT YARNS

Halil Ibrahim Icoglu[a*], Hatice Kubra Kaynak[a]

[a]Gaziantep University

*icoglu@gantep.edu.tr

Abstract:

Polyester fiber is the most used synthetic fiber in clothing industry due to its high performance properties, low cost, etc. One of the important parameters which directly affect performance of fabrics is yarn density. Microfilaments, can be defined as a filament finer than 1 dtex or 1 Denier, are commonly used for their important performance properties. In addition to performance properties, color is another important dimension for customers in clothing sector. In this study, determination and comparison of color properties of polyester Sateen dyed fabrics woven from conventional and microfilaments with different weft sett values is aimed. 5 end Sateen polyester woven fabrics with different weft yarns of 3 different filament fineness values (0.33 dtex, 0.76 dtex, 3.05 dtex) and three different weft sett values (45 wefts/cm, 47 wefts/cm and 49 wefts/cm) were dyed with a disperse blue dye by exhaust dyeing method in three different depth of shades (0.5% owf, 1.5% owf, 3% owf) at 130 ℃ in the same bath. Color measurement was carried out using a reflectance spectrophotometer (Datacolor 650) under illuminant D65/10º standard observer with the specular component included. The average of four measurement for each fabric were taken by rotating 90º clockwise after each measurement. For all dyed samples, CIELAB coordinates (L*, a*, b*, C*, h), total color difference (ΔE*) and K/S values were determined according to the reflectance values by the software of the spectrophotometer. K/S values were recorded at wavelength of maximum absorption. It is observed that L* values decrease and K/S values increase when filament fineness values decrease. It is also seen that ΔE* values of the fabric with 0.33 dtex microfilament are higher than that of 0.76 dtex microfilament according to that of 3.05 dtex filament. L* and K/S values of the fabrics with three weft sett construction are similar.

Keywords: Microfilament, Woven Fabric, Color Values, Polyester, Disperse Dye

*

EXAMINATION OF THE EFFECT OF TEMPER PROCESS ON DUAL PHASE STEEL

Fatih Hayat[a*]

[a]Karabuk University

*fhayat@karabuk.edu.tr

Abstract:

In this study, tempering properties of galvanized coated dual phase steel sheet specimens were investigated. Steel is widely used in automotive industry. It is important for its performance features as a material used either for automobile body or structural pieces such as chassis and wheels. Dual phase (DP) steel is one of them ostimportant advanced high-strength steels (AHSS). This steel has particular characteristics such as its micro-structure and superior mechanical properties. Heat treatment ability of dual phase steel is important because it is common used steel for automotive industry. DP steels provide very valuable economic and technological benefits such as easy forming, even more strength after process of forming ,low and delayed deformation osculation. Tensile strength and ductility properties of the material were studied. According the tensile test results, tensile strength of the steel was increase but ductility values was found close to each other. Beside this tensile strength of the steel decreasing with tempering process and obvious yield strength on the steel was observed.

Keywords: Dual Phase Steel, Martensite, Hardness, Tempering

Acknowledgment:

This study is a part of Project (KBÜBAP-18-YD-021) which has been supported by Karabük University.

*

THE TENSILE AND BURSTING STRENGTH EVALUATION OF LINEAR LOW DENSITY POLYETHYLENE (LLDPE) SPUNBOND FABRICS

Esin Sarioglu[a*], Hatice Kubra Kaynak[a], Halil Ibrahim Celik[a], Deniz Vuruskan[b]

[a]Gaziantep University, Engineering Faculty, Textile Engineering Department
[b]Gaziantep University, Faculty Of Fine Arts, Department Of Fashion And Textile Design

*sarioglu@gantep.edu.tr

Abstract:

In the production of the spunbond nonwovens, polypropylene (PP) is the most widely used polyolefin class polymer. There are many uses of field of PP spunbond nonwovens such as agriculture, automotive, household, hygiene and medical, packaging etc. Polyethylene is one of the polyolefins and spunbond nonwovens from this polymer exhibits excellent properties, particulary hand softness and drape. Among the polyethylene group, linear low density polyethylene (LLDPE) has advantages like as good spinnability at lower temperature required in comparison with PP. Present study was conducted to evaluate tensile and bursting strength properties of LLDPE spunbond nonwovens. For this purpose, LLDPE spunbond nonwovens were produced at different grams per meter (40 gsm, 50 gsm, 60 gsm, 80 gsm and 100 gsm). The main purpose of this study is to determine the tensile and bursting strength properties and investigate of alternative use possibilities instead of PP in the medical textile sector. Tensile and bursting strength tests were performed according to the wet and dry form of the spunbond nonwovens. SPSS 22 package program was used in order to determine the effect of the weight on these properties at 95% confidence interval.

Keywords: Linear Low Density Polyethylene, Bursting And Tensile Properties, Spunbond, Nonwoven.

*

BLENDED OF NEW GENERATION REGENERATED CELLULOSIC FIBERS WITH POLYESTER AND COTTON: THEREOF KNITTED FABRICS AIR PERMEABILITY

Deniz Vuruskan[a*], Esin Sarioglu[b]

[a]Gaziantep University, Faculty Of Fine Arts, Department Of Fashion And Textile Design
[b]Gaziantep University Textile Engineering Department

*vuruskan@gantep.edu.tr

Abstract:

The scope of this study is about the investigation on the air permeability of blended knitted fabrics of new generation regenerated cellulosic fibers with polyester and cotton, individually. Viloft®, ProModal® and bamboo were chosen as regenerated cellulosic fibers in order to evaluate their own functional properties. These fibers were blended with most commercially used fibers as cotton and polyester at different ratios as 67%/33% -%50/50% and 33%/67% to produce 19.7 tex ring spun yarns. Furthermore, 100% regenerated fibers, %100 cotton and 100% polyester ring spun yarns were also manufactured for comparison the differences. Blending of regenerated/cotton and regenerated/polyester yarns are preferred in the production of knitted fabrics so all yarn samples obtained from these yarns were knitted as single jersey at the same production parameters. The permeability of fabric to air tests were performed in accordance with the related standard at 100 Pa pressure drop by using 20 cm2 test surface area. Variance analysis was carried out using SPSS 22 statistical package program to put forward the whether there was an effect of regenerated type (Viloft®, ProModal® and bamboo), blend type (cotton and polyester) and blend ratio (100%, 67%/33% -%50/50% and 33%/67%) on air permeability of fabrics at 95% confidence interval or not. As a consequence, it was determined that these parameters have statistically significance on air permeability of single jersey fabrics.

Keywords: Viloft®, Promodal® ,Bamboo, Ring Spun Yarn, Knitted Fabric

*

TECHNICAL AND ECONOMICAL APPROACHES IN DESIGNING OF ANTIFOAMING EMULSIONS FOR LEATHER AND TEXTILE INDUSTRY

Bahri Basaran[a*], Ahmet Aslan[a], Tayfun Barisik[a]

[a]Ege University

*bahri.basaran@gmail.com

Abstract:

A foam is a substance formed by trapping pockets of gas within a liquid or solid phase and a collection of tiny bubbles formed on the surface of a liquid by agitation. The foams, one of the main functional properties of surfactants, which are widely used because of their outstanding capability of influencing the properties of surfaces and interfaces, may be desirable or undesirable in many industrial applications. Sometimes foam is exigible and makes an important contribution to product performance, for example in washing and cleaning. However; in many industrial applications, excessive foaming might create serious drawbacks and demolishes the processes and therefore needs to be prevented.

Leather beamhouse and textile finishing steps are the process series where emulsion and dispersion based applications in which surfactants are used extensively. In this research the formation and the effects of macro and micro foams arised in some physicochemical applications will be defined and various problems come out by the agitation with surfactants in aqueous media will be specified. The effect of antifoaming agents will be generalized in the viewpoint of causing the rupture of the air bubbles thereby; the newly developed prototypes will be reviewed. The economical and technical value of the antifoaming agents as per the effectivity will be evaluated.

Keywords: Antifoam, Foam, Leather.

*

IOT AND ARDUINO BASED MOBILE ACCESSIBLE SMART PARKING SYSTEM

Fatih Kayaalp[a*], Sultan Zavrak[a], Huseyin Bodur[a], Murat Oflezer[a]

[a]Duzce University

*fatihkayaalp@duzce.edu.tr

Abstract:

Because of the many facilities provided by the use of the vehicles, many people prefer to buy and use their own cars today. This results a great number of cars registered to traffic both in Turkey and the world. Although there are many facilities provided by vehicles, many problems arise because of the large number of vehicles in traffic such as increasing the carbon emissions, triggering global warming, time loss due to traffic congestion, stress on drivers, vital and financial losses caused by accidents. Because of these problems, many researchers have focused on this area with many studies.

The Internet of Things (IOT), which has emerged in recent years as a branch of the field of computer engineering, also contributes to the solution of some of these problems, especially by applications like smart homes or smart cities.

The presented work also describes a Smart Parking System, which can be considered as a smart city application, using IOT, Arduino, Mobile platform and Cloud technologies together. With this solution, it is contributed to the find free parking space locally in the parking lot for the drivers. Besides that, the parking area can be accessed and monitored on the internet via mobile applications by drivers and the parking lots can be reserved before accessing the parking area. The implemented system results as saving time and fuel, decreasing the traffic congestion caused by the vehicles during the time for searching parking place, simplifying the management of parking area.

Keywords: Iot, Arduino, Mobile, Smart Parking System, Cloud

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

EFFECT OF CARBON BLACK ON ELECTRICAL RAPID CURING OF CONCRETE

Tayfun Uygunoglu[a*], Baris Simsek[b], Emriye Cinar[a]

[a]Afyon Kocatepe University

*uygunoglu@gmail.com

Abstract:

Depending upon the hydration time, accelerated cure at the buildings in which ready mixed concrete used is important in terms of the project's predicted time since concrete compressive strength reaches the target level in a short time. Electrically conductive concrete (ECC) is a category of concrete containing electrically conductive components to attain stable and high electrical conductivity for rapid curing of concrete. In this study, carbon black was substituted in concrete at different rates (1%, 2%, 3%) and effects on electrical curing were investigated. In experiments, 10 x 10 x 30 cm moulds have been used. Different combinations of stress intensity (0V, 35V, 45V 60V and 80 V) have been used on mixtures for 24 h by AC power-supply. The measurements have been done at room temperature. Electrical cure and hydration time of the specimens with electric current application have been investigated. It has been observed that hydration accelerates with increasing stress value, and the temperatures received were increased. With the increase of the carbon black using ratio in concretes, the shorter hydration time and higher curing temperature were observed.

Keywords: Electrical Cure, Carbon Black, Hydration Time

*

MECHANICAL PROPERTIES OF EPOXY BASED POLYMER COMPOSITES WITH FLY ASH AND FURNACE SLAG

Tayfun Uygunoglu[a*], Ibrahim Gunes[a]

[a]Afyon Kocatepe University

*uygunoglu@gmail.com

Abstract:

Polymer matrix composites are gaining in popularity because of they have symmetrical and balanced material properties, production and use due to the ease of construction, aerospace and automotive structures for buildings. In addition, they do not conduct electricity and heat. Today, one of the new polymeric materials are epoxy based floor coating materials field. Epoxy resins are the most commonly used thermoset plastic in polymer matrix composites. Epoxy resins are a family of thermoset plastic materials which do not give off reaction products when they cure and so have low cure shrinkage. They also have good adhesion to other materials, good chemical and environmental resistance, good chemical properties and good insulating properties. This paper proposal has been prepared to investigate the use fly ash and blast furnace slag that largely in the form of waste creates environmental pollution with epoxy floor coating material due to advantage of these properties of polymers. Mechanical properties of polymer-based floor coating materials that was produced using waste mineral additives was characterized. For this purpose, the compressive-tensile strength, modulus of elasticity, stress-strain behavior and energy to break was determined as mechanical tests. Environmental pollution will be reduced by evaluation of the fly ash and furnace slag wastes and the space to be filled in the literature by making the characterization of existing products.

Keywords: Mechanical Properties, Polymer, Fly Ash, Furnace Slag.

*

PHOTOCATALYTIC DEGRADATION OF REACTIVE BLUE 4 USING TIO2 NANOPARTICLE-BORON INDUSTRY WASTE

Necip Atar[a*], Mehmet Lutfi Yola[b], Ceren Karaman[a], Alime Yilmaz[a]

[a]Pamukkale University, Faculty Of Engineering, Department Of Chemical Engineering
[b]Iskenderun Technical University, Faculty Of Engineering And Natural Sciences, Department Of Biomedical Engineering

*necipatar@gmail.com

Abstract:

The boron ores are important natural resources in Turkey. During boron enrichment process, a large amount of boron ore waste is discharged into waste dams from the boron plants. The waste dams containing boron minerals can cause a big environmental problem. Using industrial solid wastes for adsorption or catalyst support has been proposed in recent years for materials recycling and utilization. A novel composite containing TiO2 nanoparticles (TiO2NPs) and boron waste (BW) was synthesized and tested in adsorption and photocatalysis to remove Reactive Blue 4 (RB4) from aqueous solution. Transmission electron microscopy (TEM), X-ray photoelectron spectroscopy (XPS), and X-ray diffraction patterns (XRD) showed the formation of metal TiO2NPs on BW. The BET surface area increased after intercalation of TiO2NPs onto BW. TiO2-BW was found to be a good nanomaterial for RB4 adsorption. The effects of operating variables such as initial dye concentration, pH and contact time in adsorption were studied. The kinetics, isotherm and thermodynamic parameters for the removal of the RB4 were also investigated. In addition, TiO2-BW also shows high photocatalytic activity for degradation of RB4 from aqueous solution. The combination of adsorption and photocatalysis using TiO2-BW is demonstrated as a more effective technique for removal of dyes from aqueous solution.

Keywords: Photocatalysis, Tio2 Nanoparticles, Boron Waste, Kinetics

*

AG@AU NANOPARTICLES ANCHORED CALIX[4]ARENE FUNCTIONALIZED GRAPHENE QUANTUM DOTS: SIMULTANEOUS DETERMINATION OF L-TYROSINE AND L-TRYPTOPHAN

Necip Atar[a*], Mehmet Lutfi Yola[b], Alime Yilmaz[a], Ceren Karaman[a]

[A]Pamukkale University, Faculty Of Engineering, Department Of Chemical Engineering, Denizli, Turkey
[b]Iskenderun Technical University, Faculty Of Engineering And Natural Sciences, Department Of Biomedical Engineering

*necipatar@gmail.com

Abstract:

Amino acids are known as precursors for various significant biological substances. l-Trp is one of the most important amino acids and found in natural proteins, which is widely used in the food industry as an antioxidant and in the pharmaceutical industry as a biomarker In addition, it plays an important role in several biological processes. l-Tyr is also a kind of essential amino acid and indispensable for human to establish and maintain nutritional balance. The lack of l-Tyr may lead to albinism, alkaptonuria, depression, and other psychological diseases, while an overdose of l-Tyr could cause the increase of sister chromatid exchange. Therefore, it is significant to develop a simple, accurate, rapid and inexpensive sensor for the determination of l-Trp and l-Tyr. In this report, ruthenium nanoparticles (Ag@AuNPs) and calix[4]arene (C4A) were synthesized and grafted onto the surface of reduced graphene oxide (GQDs) sheets (Ag@AuNPs/C4A/GQDs). The morphologies of GQDs and Ag@AuNPs/C4A/GQDs composite were characterized by transmission electron microscope, scanning electron microscope, atomic force microscope and x-ray photoelectron spectroscopy. The electrochemical experiments were performed by cyclic voltammetry, electrochemical impedance spectroscopy and square wave voltammetry. The simultaneous determination of l-tyrosine and l-tryptophan was performed on glassy carbon electrode (GCE) modified with Ag@AuNPs/C4A/GQDs. The voltammetric sensor was applied to milk samples with good selectivity and recovery.

Keywords: Calix[4]Arene, Graphene Quantum Dots; Nanoparticles, Determination

*

INVESTIGATION OF WICKABILITY PROPERTIES OF MICROFILAMENT WOVEN FABRICS

Hatice Kubra Kaynak[a*], Osman Babaarslan[b], Esin Sarioglu[a], Halil Ibrahim Celik[a]

[a]Gaziantep University
[b]Cukurova University

*tuluce@gantep.edu.tr

Abstract:

Synthetic fiber industry has been enforced to make developments due to the increasing performance demands from textile products. One of the most important developments in synthetic fiber industry, is absolutely producing extremely fine filaments which are named as microfilaments. A microfilament can be defined as a filament finer than 1 dtex or 1 Denier and 1dtex polyester fiber has a fiber diameter of approximately 10 µm. It is an important factor of having a good thermophysiological comfort for textile fabrics for a comfortable and healthy use of textiles. As an aspect of thermophysiological comfort, transferring the liquid perspiration to the outer surface of the garment is an important issue. Wicking can be defined as spontaneous flow of the liquid in a porous substance, driven by capillary forces. Extremely fine filaments of microfilament fabrics provide better capillary forces and enhance the wickability of the fabrics. In this study, it is aimed to determine the effects of filament fineness, weft sett and weave type on the wickability of filament woven fabrics. For this aim, 3/2 Twill and 5 end Sateen polyester filament woven fabrics with different weft yarns of 3 different filament finenesses (0.33 dtex, 0.76 dtex, 3.05 dtex) and two different weft sett values (45 wefts/cm and 47 wefts/cm) were tested according to AATCC Test Method 197-2011, Vertical Wicking of Textiles. For comparison of the wickability of sample fabrics, the wetted height of the samples for different time intervals are determined. In order to understand the statistical importance of filament fineness, weft sett and weave type on wickability, ANOVA was performed. For this aim the statistical software package SPSS 21.0 was used to interpret the experimental data. All test results were assessed at 95% confidence interval.

Keywords: Microfilament, Woven Fabric, Wickability, Liquid Transport, Weave, Filament Linear Density

*

BURSTING STRENGTH OF KNITTED FABRICS PRODUCED FROM OF POLYBUTYLENE TEREPHTHALATE (PBT) YARNS WITH DIFFERENT FALSE-TWIST TEXTURING PARAMETERS

Halil Ibrahim Celik[a*], Esin Sarioglu[a], Hatice Kubra Kaynak[a]

[a]Gaziantep University

*hcelik@gantep.edu.tr

Abstract:

Polybuthylene Terephtalate (PBT) is a semi-aromatic polyester. It provides advantages such as high elasticity, ease of dyeing at lower temperatures. Due to their especially high elasticity property, PBT fibers become popular in textile industry with an increasing rate and used for the production of many textile applications such as; underwear, sport cloths, carpet piles, hosiery etc. In order to introduce more softness, bulk, warmth and extensibility, synthetic continuous filaments yarns are applied some mechanical, thermal or chemical processes. These processes are called as texturing. The texturing process parameters have significant effect on physical and mechanical characteristics of the yarn. Since the yarn properties have important influence on fabric performance, it is considered that the texturing parameters may affect the fabric mechanical properties. In this study, it is intended to reveal the effect of temperature of heating zone and draw ratio on knitted fabric bursting strength performance. For this aim, partially oriented (POY) 110 dtex/24 filament PBT yarn samples were applied false-twist texturing process with three different heating temperatures (175, 200, 225 0C) and three different draw ratios (1.2, 1.4, 1.6). Totally, 9 false-twist textured stretch PBT yarn samples were produced. Then, knitted fabric samples were prepared under same conditions and with same fabric structure parameters. In order to obtain bursting strength and bursting distension values, the knitted fabric samples were applied bursting strength test in accordance with BS EN ISO 13938-1:1999 standard. The effect of texturing parameters (heating zone temperatures, draw ratios) on knitted fabric bursting strength was investigated by performing ANOVA. The statistical software package SPSS 21.0 was used to interpret the experimental data. All test results were assessed at 95% confidence interval.

Keywords: Bursting Strength, Bursting Distension, Polybuthylene Terephtalate, Texturing, False-Twist

*

FINITE ELEMENT ANALYSIS APPLICATIONS TO TEXTILE MATERIALS: A CASE STUDY ON PET YARN MECHANICAL PROPERTIES

Burak Sahin[a], Halil Ibrahim Celik[b*], Hatice Kubra Kaynak[b]

[a]Mechanical Engineering, Gaziantep University
[b]Textile Engineering, Gaziantep University

*hcelik@gantep.edu.tr

Abstract:

Finite element analysis (FEA) is a numerical solution method for engineering problems. It predicts system behavior for real working and environment conditions. FEA is an effective tool to predict the behavior of products affected by many influence namely mechanical stress, fatigue, thermal effects and motion. Textile materials such as fiber, yarn and fabric are supposed to different kinds of loading during their usage. Modeling of these products is vital to have enough knowledge about their material characteristics and performance evaluation. But modeling of mechanical properties of textile material is difficult by FEA due to following reasons:

- Yarn is not a solid material. It consists of fibers
- The fibers inside the yarn structure have motion capability and elasticity
- Each yarn has different packing density i.e. the spaces between fibers forming yarn structure
- The yarns that compose the fabric structure have interaction between each other
- Fabric structure has high elasticity and flexibility

Some studies on modeling of impact and tensile properties of textile materials can be reached in literature. In this study, different FEA studies for textile materials in literature are reviewed. In addition, mechanical properties (breaking strength and elongation) of polyester yarn, one of the widely used synthetic fibers, are investigated by finite element modeling as a case study.

Keywords: Finite Element Analysis (FEA), Polyester, Yarn, Breaking Strength, Breaking Elongation

*

INVESTIGATION OF MICROSTRUCTURAL AND MECHANICAL PROPERTIES OF GRAPHENE REINFORCED AL-4CU COMPOSITES

Cantekin Kaykilarli[a*], Burak Kucukelyas[b], Nazli Akcamli[b], Deniz Uzunsoy[b], Nurhan Cansever[a]

[a]Yildiz Technical University
[b]Bursa Technical University

*cantekin.kaykilarli@btu.edu.tr

Abstract:

Al-Cu alloys have been used in many industries such as aerospace and automotive due to their low density and high mechanical strength. Graphene has outstanding properties and it is a potential candidate as reinforcement additive for metal matrix composites to obtain enhanced mechanical properties. In the present study, Al-4Cu alloy powders were produced from elemental powders of Al and Cu via mechanical alloying technique. Also, graphene additives were produced via electric arc discharge method in our laboratories by previously optimized process parameters as few-layered platelets. Powder metallurgy routes were used to produce composites having different amount of graphene as 0 0.25 0.50 and 1 wt%. The starting powders of Al, Cu and graphene were mechanically alloyed for different durations up to 9 h. The characterization of mechanically alloyed powders were performed using differential thermal analysis (DTA), X-Ray diffraction (XRD) and Scanning Electron Microscopy (SEM) techniques. Mechanical alloyed powders uniaxially pressed at 400 MPa and sintered at 590 °C for 3 hours under Ar atmosphere. Structural and physical properties of sintered samples were investigated through Archimedes density, SEM, XRD techniques. Additionally, mechanical characterization of bulk sample were performed in terms of hardness and reciprocating wear tests. Mechanical alloying duration and graphene amount were optimized according to the characterization results of the produced Al-4Cu composites reinforced with graphene.

Keywords: Al-4Cu Alloys, Graphene Nano Platelets, Powder Metallurgy, Microstructure, Mechanical Properties

*

PROCESSING AND CHARACTERIZATION OF EQUATOMIC FENICU ALLOYS VIA MECHANICAL ALLOYING

Burak Kucukelyas[a], Cantekin Kaykilarli[b*], Serzat Safaltin[c], Nazli Akcamli[a], Deniz Uzunsoy[a], Sebahattin Gurmen[c]

[a]Bursa Technical University
[b]Yildiz Technical University
[c]Istanbul Technical University

*cantekin.kaykilarli@btu.edu.tr

Abstract:

Nowadays, nanoparticle synthesis is the intensively research area due to the extraordinary properties of nano-sized particles. Mechanical alloying (MA) is a solid-state and room-temperature powder processing technique. Mechanical alloying method enables to obtain fine microstructures with tailored set of properties which are hard to obtain via conventional processing techniques. In this study, crystalline ternary FeNiCu alloy nanoparticles are prepared via mechanical alloying in a planetary ball mill. The high purity (> 99.7%) elemental starting powders with <45 µm particle size are utilized in (33.3 at.%) equatomic percentages. Milling operations are conducted with tungsten carbide (WC) vial and balls (5 mm in diameter) for 250 rpm during 54 hours. The ball-to-powder weight ratio is 10:1. The synthesized powders are characterized through X-ray diffraction (XRD), Particle size analysis (PSA), Scanning electron microscopy (SEM) and energy dispersive spectroscopy (EDS) techniques. The crystallite size and lattice strain values of alloys are calculated by Scherrer's formula based on XRD results.

Keywords: Fenicu Alloys, Equatomic Systems, Mechanical Alloying, Scanning Electron Microscopy, X-Ray Diffraction

*

INVESTIGATION OF MICROSTRUCTURAL AND MECHANICAL PROPERTIES OF GRAPHENE REINFORCED AL-10SI-2CU COMPOSITES

Berk Senyurt[a*], Cantekin Kaykilarli[a], Nazli Akcamli[a], Deniz Uzunsoy[a]

[A]bursa Technical University

*berk.senyurt@btu.edu.tr

Abstract:

Aluminium and its alloys' applications are limited for automotive and aerospace industries due to their low strength and wear resistance properties. The demand for light weight and high strength materials increased in many engineering applications. Aluminum matrix composites allow to obtain tailored properties for the special application areas. Graphene has a strong potential to be used as reinforcement additive for Al-matrix composites with its remarkable mechanical properties. In this study, graphene reinforced Al-matrix composites were produced by mechanical alloying as a room–temperature powder processing technique based on applied mechanical forces at high milling rates. The graphene nanoplatelets (GNPs) reinforcements are produced by electric arc discharge method in our laboratories with few-layered structure and high purity. The Al-alloy powders (with 10 wt.% of Si and 2 wt.% of Cu) and GNP reinforced composite powders are obtained from the elemental powders of Al, Si and Cu by mechanical alloying up to 9 hours. The characterization of the synthesized powders are made by differential thermal analysis (DTA), X Ray Diffraction (XRD), Scanning Electron Microscopy (SEM) and particle size analysis (PSA) techniques. Moreover, the mechanically alloyed powders are transferred into bulk structures by pressureless sintering process through uniaxial pressing at 500 MPa and sintering at 500 °C for 4 h under Ar atmosphere. The characterization of sintered samples are performed in terms of physical, mechanical and microstructural properties. Accordingly, the Archimeds' density, XRD, optical microscope (OM), SEM, microhardness test and reciprocating wear test are applied. As a result, the optimal values of mechanical alloying duration and graphene amount for GNP reinforced Al-10Si-2Cu composites are determined in the light of characterization results as important process parameters.

Keywords: Al Matrix Composites, Graphene Nano Platelets, Powder Metallurgy, Microstructure, Mechanical Properties.

*

EFFECTS ON HAY YIELD OF COMMON VETCH (VICIA SATIVA L.) AND TRITICALE (X TRITICOSECALE WITTMACK.) MIXTURE RATES IN BINGOL CONDITIONS

Kagan Kokten[a*], Hariwan Abdullah Yousif[b], Mahmut Kaplan[c], Halit Tutar[a]

[a]Bingol University
[b]Duhok University
[c]Erciyes University

*kahafe1974@yahoo.com

Abstract:

Conducted under Bingol conditions during the 2016 growing season, this study is aiming to analyze the effect of common vetch (Vicia sativa L.) and triticale (X Triticosecale Wittmack.) mixture ratios on hay yield.

Plant materials of the study were Gorkem common vetch variety, obtained from Department of Field Crops, Faculty of Agriculture, Dicle University, and Tacettin Bey Triticale variety, obtained from GAP International Agricultural Research and Training Center. The research has been established as a randomized complete block experimental design with three replications In the study; vetch stem length, triticale plant height, green herbage yield, vetch rate in the green herbage, dry hay yield, vetch rate in the hay and relative yield total have been analyzed. The results of variance analyses indicated statistically significant differences among some characters (green herbage yield, vetch rate in the green herbage, dry hay yield, vetch rate in the hay and relative yield total ($P \leq 0.01$)). The findings of the study indicated that vetch stem length of the mixtures ranged between 56.40 and 61.23 cm, triticale plant height ranged from 77.60 to 87.73 cm, green herbage yield from 769.78 to 1090.67 kg/da, vetch rate in green herbage from 6.51% to 100.00%, dry hay yield from 290.83 to 644.24 kg/da, vetch rate in hay from 11.01 to 100.00% and relative yield total from 1.00 to 1.40.

Based on the findings of this study, we can conclude that a mixture ratio of 20% vetch + 80% triticale may be the best mixture ratio in terms of highest dry hay yield and relative yield total for Bingol and other similar ecological regions.

Keywords: Common Vetch (Vicia Sativa L.), Triticale (X Triticosecale Wittmack.), Mixture, Hay Yield

*

DETERMINATION OF SILAGE POTENTIAL AND NUTRITIONAL VALUES OF SOME TRITICALE CULTIVARS

Mahmut Kaplan[a], Kagan Kokten[b*], Yusuf Murat Kardes[a], Selim Ozdemir[b]

[A]erciyes University
[B]bingol University

*kahafe1974@yahoo.com

Abstract:

The study was conducted to determine silage potential and chemical composition of triticale cultivars to be used for silage. Ten different cultivars of triticale (Umran Hanim, Melez, Mehmet Bey, Tatlicak 97, Ayse Hanim, Alper Bey, Mikham 2002, Presto, Tacettin Bey, Karma) were used as plant material in the study. Experiment was carried out in randomized block design with 3 replications during the growing seasons of 2015-2016 under Elazig conditions. The experimental plots were harvested at dough stage of the plants. The plants were chopped in 2.5-3 cm pieces, filled and sealed in 2 kg deflated vacuum bags. Then the samples were preserved in dark for 60 days. Sample bags were opened and silage were chemical composition were investigated.

Results revealed that dry matter content of the silage varied between 36.01% and 42.19%, crude protein content (CP) between 6.36% and 8.33%, crude ash content (CA) between 6.11% and 7.21%, neutral detergent fiber (NDF) content between 51.46% and 57.66%, acid detergent fiber (ADF) content between 31.11% and 41.25%, pH between 4.52 and 4.78, digestibility of dry matter (DDM) between 56.77% and 64.66%, dry matter intake (DMI) between 2.08% and 2.33%, relative feed value (RFV) between 91.60 and 116.78, depending on the cultivars. It was concluded that all triticale cultivars could be used as a quality silage crop for animal feeding.

Keywords: Triticale Cultivars, Silage, Chemical Composition, Relative Feed Value

*

EFFECT OF FINAL THICKNESSES ON MECHANICAL PROPERTIES OF HOT ROLLED COIL PRODUCTS MADE OF HIGH YIELD STRENGTH STEELS FOR COLD FORMING

Sibel Daglilar[a*], Aycan Atici[b]

[a]Yildiz Technical University
[b]Isdemir A.S., 31319 Iskenderun, Hatay, Turkey.

*sdaglilar@gmail.com

Abstract:

In this study, the relationship between thickness and mechanical properties of hot rolled coil products made of high yield strength steels for cold forming (EN 10149-2, S600MC), was investigated. In experiments, slab dimensions were 225mm*1255mm*12000mm. As rolling conditions, FM (Finishing Mill) entrance temperature was 950°C, FM exit temperature was 820°C, and coiling temperature was 520°C. The chemical compositions of the steel samples were prepared as standard and the sum of Nb, V and Ti were to be lower than 0,22%. Four different thicknesses (12, 10, 4, 3 mm) were used. The mechanical properties aimed were, yield strength min 600 N/mm2, tensile strength 650 - 820 N/mm2 and elongation min 13%. According to EN standard for thicknesses higher than 8 mm the minimum yield strength can be 20 N/mm2 lower. The change of mechanical properties related to thickness differences were searched. The study indicated that, at the same chemical compositions and different reduction rates, thicker products have lower yield strengths.

Keywords: Chemical Composition, Hot Rolling, High Yield Strength, Mechanical Properties, Thermomechanical Rolling, Coiling Temperature

*

INVESTIGATION OF FLAVONOL TRANSPORTATION MECHANISM BY USING POLYMER INCLUSION MEMBRANE

Alime Yilmaz[a*], Necip Atar[a], Mehmet Lutfi Yola[b]

[a]Pamukkale University
[b]Iskenderun Technical University

*alimey@pau.edu.tr

Abstract:

Flavonoids are a secondary plant phenolics class which have antioxidant and chelating properties. They are the most abundant in fruits, vegetables, wines, tea. Flavonols are the main class of flavonoids; the most common flovonols are quercetin, kaempferol and myricetin. In this study, synthetic quercetin flavonol was transported by using polymer inclusion membrane. Polymer inclusion membranes composed of cellulose tri acetate (CTA) base polymer material , 2-NPOE plasticizer material and Aliquat 336 (TOMA-C) carrier material. For the most efficient quercetin transportation; membrane composition was optimized by determination amount of each component. pH of acceptor phase, acid type and quercetin concentration for donor phase effects were investigated for obtaining optimum transportation conditions. Under optimum transportation conditions; reaction order of transportation was determined. According to reaction mechanism k (rate constant), J (flux), P (permeability coefficient) and D (diffusion coefficient) values were calculated. Within optimum conditions, transportation of synthetic quercetin was done with 62 % yield.

Keywords: Polymer Inclusion Membrane, Quercetin, Separation

*

CO-PYROLYSIS OF WASTE TYRES WITH RICE HUSK IN A FIXED BED BATCH REACTOR

Derya Yesim Hopa[a], Alime Yilmaz[b*], Arif Sarikaya[a]

[a]Afyon Kocatepe University
[b]Pamukkale University

*alimey@pau.edu.tr

Abstract:

In this study, the mixtures of waste tyres and rice husk were subjected to pyrolytic conversion which was conducted in a batch reactor at 450 ºC, with a heating rate of 10 ºC/min at inert atmosphere of nitrogen gas with a flow rate of 1L/min. The co-pyrolysis of waste tyres with rice husk was conducted with different weight percentages of rice husk: 0%, 25%, 50% and 75%. The effect of rice husk addition on the liquid yield, and on the calorific value of liquid product was investigated. According to the results of the study, it was observed that the yield and the calorific value of the liquid product were generally reduced with increasing amounts of rice husk. The addition of 75% rice husk reduced the liquid yield from 33%(wt.) to 21,31 %(wt.) and the calorific value from 10020 Kcal/kg to 8651 Kcal/kg. It was observed that only at 25% addition of rice husk, there was a small increase in calorific value of pyrolytic liquid, that was from 10020 Kcal/kg to 10096 Kcal/kg. It was thought that, the smaller amounts of rice husk addition could be better for co-pyrolysis and an experiment with 10% addition of rice husk was conducted. According to the results of this experiment, 10% addition of rice husk increased the calorific value of pyrolytic liquid from 10020 Kcal/kg to 10281 Kcal/kg with keeping the liquid yield constant at 33% (wt.).

Keywords: Pyrolysis, Waste Tyre, Rice Husk

*

BEHAVIOR OF STEEL WIRE FIBRED HIGH PERFORMANCE CONCRETE PLATES UNDER LOOSELY CLAMPED BOUNDARY CONDITIONS

Selcuk Emre Gorkem[a*]

[a]Erciyes University

*selcukgorkem@yahoo.com

Abstract:

Plates are flat structural members. Their thicknesses are quite smaller than other dimensions. Plates may be classified by ratio of thickness to smaller span length as thin plate or thick plate. There are different types of loads act on plates. These loads could be classified by their acting areas. When acting surface become smaller, the load could be called as a concentrated load. In this study, one of the fairly known practical plate problems were investigated, a square plate laterally loaded with a single concentrated load at midspan under all edges clamped. Clampings were made continuously along edges. Experiment system prepared by using U140 (h=140 mm) steel profiles. Profiles perforated by 400 mm spacing along their axis of symmetry to attach to steel rods. Plates were placed between two U140 profiles along plate edges than attached. Attachments were made only along the axis of symmetry of profiles. Therefore small quantity of rotation could be exist along clampings and plates having this type of side clampings could be called as loosely clamped. High performance concrete plates containing steel wire fibres, volumetrically %0.5 and %1, constructed and tested. To observe from thick plate to thin plate behavior, plate sizes arranged to 660x660x40 mm (40/660>1/20 thick plate) and 1080x1080x40 mm (40/1080<1/20 thin plate). Load-Deflection and Load-Strain relationships were measured. Deflection measurements were made at 5 points in thick plates. One of them is at the midspan, others were on the symmetry axes and far from boundaries by one-fourth of the length of plate. In thin plates, deflection measurements were made not only ¼ length from boundaries, but also at thick plates' measurement points to compare deflections. In loosely clamped edges, rotations of supports at corresponding loading values were also measured. Mechanical properties of high performance reinforced concrete and steel wire fibres were examined. Fracture patterns of thick and thin plates were investigated. In addition to test results, plates were modeled and analysed with finite element analysis program. Analysis results and test results were compared.

Keywords: Plate, Loosely Clamped Plate, High Performance Concrete, Steel Fibred Concrete

[*]*This study was supported by Scientific Activities Support Program of Karadeniz Technical University*

INVESTIGATION OF MICROSTRUCTURE AND MECHANICAL, CORROSION PROPERTIES OF ALUMINUM ALLOYS COATED WITH NICKEL-COPPER BASED POWDER AA5754 THROUGH HIGH VELOCITY OXYGEN FUEL POWDER SPRAYING METHOD (HVOF) WHEN COMBINED THROUGH FRICTION STIR WELDING

Zarif Catalgol[a], Yavuz Akkas[a], Hasan Kaya[b], Ramazan Samur[a*], Mehmet Ucar[c]

[a]Marmara University, Department Of Metallurgical And Materials Engineering
[b]Department Of Machine And Metal Technology,Asimkocabiyik Vocational School Of Higher Education, Kocaeli University
[c]Department Of Automotive Engineering, Faculty Of Technology, Kocaeli University

*rsamur@marmara.edu.tr

Abstract:

In this study, AA5754 aluminum alloy sheets material was cut with the mechanical guillotine shears 2x100x300 mm size. The cut aluminum plate welding regions of the shears to be treated with the friction stir welding were coated with nickel-copper based powder 100µm thick by High Velocity Flame Spraying (HVOF).To use in friction stir welding, height-mixing tool with cone geometry, friction with 20mm shoulder diameter and 1.8mm pin was produced through machining from hot-work tool steel. To identify the microstructure, mechanical properties and corrosion properties of the welding joints, after coarse and fine sanding, 1µm diamond polishing process was applied to the samples cut with a water jet without being affected by heat. The hardness values of these samples were calculated in a linear axis by Vickers hardness measurement method to cover the whole of the base material and welding. The polished samples were cauterized and then their micrographs were taken through optical microscopy and scanning electron microscopy (SEM), and EDS analyses were performed. The resulting data were used to analyze the microstructure of joints, and mechanical and corrosion properties.

Keywords: Ni-Copper Based Powder Coating Material Of The Welding Region, Friction Stir Welding Process, Microstructure, Mechanical And Co

MARMARA UNIVERSITY,BAPKO,FEN-C-YLP-120917-0539

MICROSTRUCTURAL CHARACTERIZATION AND HEAT TREATMENTEFFECT ON PHOTOLUMINESCENCE OF BATA2O6:SM3+PHOSPHOR

Mustafa Ilhan[a*], Zarif Catalgol[a], Seyyid Abdulkadir Ilhan[b], Ramazan Samur[a]

[a]Department Of Metallurgical And Materials Engineering, Marmara University
[b]Department Of Materials Science And Engineering, Sakarya University

*mustafa.ilhan@marmara.edu.tr

Abstract:

Trivalent samarium ion (Sm3+) doped (2.5 mol%) BaTa2O6 phosphors were sintered by solid state reaction route at temperatures between 1150 and 1425 °C for 20 hours in order to determine temperature effect on structural and luminescence properties. Structural and luminescence properties of the ceramic powder samples were investigated by X–ray diffraction (XRD), scanning electron microscopy (SEM), energy dispersive spectroscopy (EDS) and photoluminescence (PL) analyses. In XRD analysis, while Sm3+ doped BaTa2O6 structure has single phase tetragonal tungsten bronze (TTB) structure above 1350 °C, small amount orthorhombic BaTa2O6 phase appeared at temperatures of 1150 and 1250 °C. SEM analysis revealed that size of Sm3+ doped BaTa2O6 grains increased with increasing the heat treatment temperature. In the PL analysis, depending on the increase in heat treatment temperature, the intensity of emission reached maximum at 1425 °C. Increase of the emission intensities of 4G5/2→6H5/2 and 4G5/2→6H7/2 transitions may have been attributed to the improving crystallinity and growing symmetry, with the increasing of temperature.

Keywords: XRD; SEM; Heat Treatment; Photoluminescence; Rare Earth Ion

**The conducted study was economically supported by Scientific Research Projects Unit of Marmara University with the grant number:*

EFFECT OF THE ADDITIONS OF DEHYDRATED GEOPOLYMER POWDERS ON COMPRESSIVE STRENGTH AND MICROSTRUCTURE OF THE FINE ALUMINA POWDER REINFORCED NA-METAKAOLIN BASED GEOPOLYMER COMPOSITE.

Suleyman Yasin[a*], Hayrettin Ahlatci[a]

[a]Department Of Metallurgy And Materials Engineering, Engineering Faculty, Karabuk University

*syasin@karabuk.edu.tr

Abstract:

Geopolymers are inorganic binders or materials that have become a new alternative for high-temperature applications with their thermal superiority to traditional Portland cement. In this study, it was aimed to enhance the properties of fine alumina powder reinforced geopolymer matrix composite with an inorganic additive without causing an unfavourable new phase in the final product. For this purpose, primarily dehydrated geopolymer powders (DGP powders) were produced. Subsequently, samples were prepared by adding irreversibly dehydrated geopolymer powders to fine alumina powder reinforced Na-Metakaolin based geopolymer resin up to 5 wt.%. For the production of the samples, the usual wet-cast and temperature curing method were used. The compressive strength, phase structure, microstructure and dimensional stability of the produced specimens were investigated. Because of the addition of the optimum amount of DGP powders (1.25 wt.%), the compressive strength, the compactness of the microstructure and the thermal stability were increased in the samples. At the higher amount of addition, it has been determined that due to the formation of excessively porous micro-structure, the compressive strength is decreasing. The added powders did not cause a significant change in the phase structure of the final composite.

Keywords: Geopolymer, Metakaolin, Alumina, Dehydrated Geopolymer Powder

Acknowledge:

"THIS STUDY IS SUPPORTED BY THE KARABUK UNIVERSITY COORDINATORSHIP OF RESEARCH PROJECT (KBÜBAP-18-YD-023), TURKEY."

INVESTIGATION OF THE REDUCTION RATE OF COMPOSITE PELLETS CONTAINING FLUE DUST AND MILL SCALES AT DIFFERENT TEMPERATURES

Engin Cevik[a*], Furkan Ozkan[b], Mustafa Boyrazli[c], Elif Aranci Ozturk[c]

[a]Iron And Steel Institue
[b]Karabuk University
[c]Firat University

*engincevik@karabuk.edu.tr

Abstract:

Storage of blast furnace flue dusts is an important environmental issue in integrated iron and steel plants. The stored dusts cause environmental pollution because they have very small grain size. Flue dusts can be fed back to the blast furnace with sinter blend, but this percentage does not exceed 10%. Due to this reason, in this study, it is aimed to produce composite pellets by adding the mill scales to the flue dusts at different ratios. Calcite was added in such a way as to have a basicity ratio of 0.7. The Fe / C ratio is 3 as provided by coke. The blends prepared at the specified ratios were pelleted in the pelletizing disc. 5% Na-CMC was used as the binder. Compression strength and porosity tests were carried out after the pelletization process. Then, the reduction tests were carried out at three different temperatures (1200-1300-1400 Co) in an atmosphere controlled furnace. Reduction rate was determined based on oxygen loss before and after reduction. It was observed that while the amount of flue dust increased reduction of pellets was decreased. After the reduction, XRD and SEM analyzes were applied to characterize the produced iron nuggets.

Keywords: Composite Pellets, Reduction Rate, Mill Scales, Flue Dusts

Acknowledge:

"This study is a part of Project (KBÜBAP-18-YD-024) which has been supported by Karabük University."

EXTRACTION OF VANADIUM AND ZIRCONIUM FROM RED MUD WITH ACIDIC LEACHING

Tugba Selcen Atalay[a*], Isil Kerti[b], Hakan Burak Karadag[a], Yasin Ramazan Eker[a], Mehmet Muzaffer Karadag[c]

[a]Necmettin Erbakan University
[b]Yildiz Technical University
[c]Selcuk University

*tsatalay@konya.edu.tr

Abstract:

Red mud is the residue of Bayer process commonly used for aluminum production from bauxite. The ore treated with NaOH under pressure is thereafter filtered and involved the formation of valuable metals rich sludge. In this study, extraction behavior of vanadium and zirconium in red mud has been investigated with using hydrochloric acid and citric acid. The evolution of extraction rates according to leaching temperature (25, 50, 100°C), leaching time (1, 3, 5 h) and acid concentration (1 M, 4 M, 8 M HCl; 1.04 M, 3.13 M, 5.21 M Citric acid) has been studied. The highly acidic media obtained with hydrochloric has been more effective to the dissolution of both metals especially V. The dissolution yield of vanadium has increased as leaching time raised from 1 h to 5 h in 8 M HCl solution. 10.92% and 6.14% are respectively the dissolution yields of V and Zr obtained with using 8 M HCl at 50°C during 3 h leaching.

Keywords: Leaching, Red Mud, Vanadium, Zirconium

*

HARDWARE BASED FACE MATCHING SYSTEM

Fatih Ilkbahar[a*], Resul Kara[a]

[a]Duzce University

*fatihilkbahar@duzce.edu.tr

Abstract:

The use of biometric security systems is increasing nowadays. Face recognition systems, which are part of biometric systems; is preferred because of its simplicity of use and its safety at the ideal level. They are preferred and used in many areas such as security departments, commercial enterprises, public institutions rapidly. It is important that face recognition systems work in real time.

The duration of automatic recognition of a searched human face by using the video data obtained from security cameras takes quite a long time on conventional computers. The greatest reason for the long duration of the process in computers with classical processors is that computers have low ability of processing simultaneously. Field Programmable Gate Arrays (FPGAs), which has the ability to perform different operations at the same time is used in order to reduce the processing time of facial recognition system, Thanks to the system designed using the Very High Speed Integrated Circuit Hardware Description (VHDL) hardware recognition language, matching process of information belonging to different human faces has been done successfully. Design has been achieved by combining Eigenfaces and Local Binary Pattern (LBP) algorithms which are conventionally-used techniques in facial recognition systems. For the hardware design, Nexys4-DDR card with the artix 7 series fpga chips manufactured by Xilinx company is preferred. Speed increase is shown by analysing the results in table format based on the comparison made between images whose features are extracted by choosing the face image in the Orl data sets, which is generally preferred by the researchers

Keywords: Face Recognition,Fpga,Eigenfaces,Lbp

**This project is supported by Duzce University Research Fund Project Number: 2017.06.01.568"*

HYBRID METHOD FOR REDUCING ILLUMINATION EFFECT IN FACE RECOGNITION SYSTEMS

Fatih Ilkbahar[a*], Resul Kara[a]

[a]Duzce University

*fatihilkbahar@duzce.edu.tr

Abstract:

Researchers continue to design safer systems with the development of intelligent cameras and technology. Biometric systems provide convenience in the identification and identification of people in their daily lives. Costs such as labor power, time and energy are reduced and productivity is increased. Recognition rates are reduced in images where facial recognition systems have low / high light intensity. In this work we have done, recognition of light intensity without being affected by low (dark) or high light intensity (extremely bright) environments has been provided. When we examine the facial recognition system in general, we first need to find the positions of the human faces in the picture. We use the Viola and Jones algorithm in the literature. The image is recorded in the database by extracting the features of the human faces. The comparison between the faces in the image and the faces in the database is done using basic component analysis in addition to the gabor wavelet method. Raspberry pi 3.0 borrow is used as a hardware to operate independently from the computer. For real-time operation, the camera module with Sony IMX 219 PQ CMOS image sensor is used to transfer images in the real environment. Thanks to this work, about 20 people taken in the outdoor environment and 15 people in the image were recognized correctly. Approximately 75% correct recognition was achieved. Thanks to this new approach, the correct recognition rate of the system has been increased and at the same time it has been able to be operated independently from the computer. Instant information sharing is provided by taking security cameras in place.

Keywords: Face Recognition,Gabor Filter, Pca, Hardware

[*]This project is supported by Duzce University Research Fund Project Number: 2017.06.01.568"

AUTOMATIC CALCULATION OF POLARITY RATES IN TURKISH WORDS

Atilla Suncak[a*], Ozlem Aktas[b]

[a]Kastamonu University
[b]Dokuz Eylul University

*atillasuncak@kastamonu.edu.tr

Abstract:

Sentiment analysis is a process used for knowledge extraction from the text. In order to perform this analysis properly, polarity rates or scales of the words are needed. 'WordNet' is the exact tool that is needed for sentiment analysis that includes those scales assigned to each word and various studies have been performed in order to create a WordNet for English. Turkish, on the other hand, is a much different language structurally or grammatically from English. In order to create a WordNet for Turkish, many studies have been performed, however the main problem is that, one-to-one translation from English cannot be applied due to the meaning loss and creating the words manually takes much time. SentiTurkNet is a study that has been created by Sabanci University and includes nearly 15000 Turkish words with their lexicons, glosses, polarities and part-of-speech (POS). In this study, we performed an automatic calculation of polarity rate extraction for the Turkish words which are not held in SentiTurkNet using the synonym, antonym and close-meaning equivalences of the target word gathered in the lexicon. Thus, we will be close one more step to the main goal, which is to achieve a WordNet for Turkish, by contributing to improve SentiTurkNet. Moreover, this work will be a reference for the users working in this area.

Keywords: Sentiturknet,Synonym,Antonym,Polarity Rate,Turkish,Sentiment Analysis

*

UFMC TRANSMISSION WITH DIFFERENT TYPE OF FILTERS IN MULTIPATH CHANNEL FOR 5G NETWORKS

Tuncay Eren[a*], Aydin Akan[b]

[a]Research And Development Department, Netas
[b]Katip Celebi University,Izmir

*tun.eren@gmail.com

Abstract:

Wireless communication systems require high bandwidth efficiency in frequency domain in order to provide high data rate in mobile environments. Orthogonal Frequency Domain Multiplexing (OFDM) is a popular signal model which uses orthogonal sinusoidal subcarriers and hence more bandwidth in the spectrum is obtained. This modulation scheme and signal model is widely used in 4G LTE Advanced systems. However, with the increasing demand for high data rate in mobile communication systems, the current research activities focus on 5G mobile networks. Although traditional OFDM system works fine and provide high quality of services for 4G networks , it has some drawbacks such as high out-of-band radiation which leads to high peak-to average power ratio (PAPR) and hence cannot be used for 5G systems. Universal Filtered Multi-Carrier (UFMC) system seems to be a promising waveform for 5G and beyond in terms of improved spectrum efficiency where OFDM out-of-band spectral leakage is reduced. The subcarriers at the output of IFFT block are divided into subbands and each subband with a fixed number of subcarriers is filtered.

In this paper, we will firstly simulate the OFDM spectrum and show the performance of OFDM in Rayleigh multipath channel. Secondly, UFMC model is investigated and applied through the Rayleigh wireless channel. At the transmitter side we will use different filter models and make comparison of the spectrum at the filter outputs. In both transmission techniques, bit error rate is measured in the same multipath environment and their simulation results are compared.

The simulation results show that UFMC outperforms OFDM in terms of obtaining better spectrum.

Keywords: UFMC, OFDM, Filter

*

MACRO NUTRIENT UPTAKE OF TALL FESCUE (FESTUCA ARUNDINACEA) AS EFFECTED BY SALT STRESS

Mahmut Kaplan[a], Ali Unlukara[b], Ihsan Serkan Varol[b*], Hasan Kale[c]

[a]Erciyes University, Faculty Of Agriculture, Department Of Field Crops

[b]Erciyes University, Faculty Of Agriculture, Department Of Biosystems Engineering

[c]Bozok University, Bogazliyan Vocational College, Department Of Plant And Animal Production

*svarol@erciyes.edu.tr

Abstract:

Plants are exposed to various stress factors at different levels in their natural habitats. Such factors are quite effective in plant nutrient uptake. The present study was conducted to investigate macro nutrient uptake of tall fescue (Festuca arundinacea) under different irrigation water salinities (0, 3, 5 and 8 dS/m) representing different salt stress levels. Experiments were conducted in randomized blocks design with 3 replications for two years (2014-2015) in Kayseri in Turkey. Irrigation waters with different salinity levels were prepared by using CaCl2, NaCl and MgSO4 salts. Irrigations were performed through drip lines.

While the effects of salt doses on all macro nutrient contents were found to be highly significant, year and year x salt interactions had highly significant impacts on all macro nutrients, except for nitrogen ($P<0.01$). Increasing nutrient contents were observed with increasing salt doses. Calcium (Ca) contents varied between 658131-104563 mg/kg, potassium (K) contents between 24692.8-30231.3 mg/kg, magnesium (Mg) contents between 1384.2-1987.5 mg/kg, sodium (Na) contents between 99.3-525.7 mg/kg, phosphorus (P) contents between 2609.5-3255.8 mg/kg, sulphur (S) contents between 2011.0-3496.5 mg/kg and finally nitrogen (N) contents varied between 10170.7-13080.5 mg/kg. Despite the yield loses, salt stress contributed to production of herbage rich in macro nutrients, thus provided support in reducing supplementary feed stuff to livestock.

Keywords: Tall Fescue, Salt Stress, Macro Nutrient

*

EFFECTS OF VARIOUS FERTILIZERS ON YIELD AND WATER USE OF PUMPKIN SEED

Ali Unlukara[a*], Ihsan Serkan Varol[a], Adem Gunes[b]

[a]Erciyes University, Faculty Of Agriculture, Department Of Biosystems Engineering
[b]Erciyes University, Faculty Of Agriculture, Department Of Plant Nutrition And Soil Science,

*unlukara@gmail.com

Abstract:

Recently Turkish Agriculture, Food and Animal Ministry encouraged farmers to use organic or organo-mineral fertilizers. But farmers need further information about effect of these fertilizers on plant performances. This experiment was conducted to determine of various fertilizers such as mineral fertilizer (MF), Hexaferm organo-mineral fertilizer (OM) and compost + mineral fertilizer (CM) on pumpkin (Cucurbita pepo L.) yield and water use in Kayseri/Turkey. Mineral and organo-mineral fertilizers amounts were calculated according to 9-9-9 (9% N, 9% P2O5, and 9% K2O) needs of pumpkin. N, P and K contents of mineral fertilizer were 15-15-15, organo-mineral fertilizer included 9-9-9 and also 20% organic matter, and CM were consisted of a compost fertilizer (1.2% N, 1% P2O5, 1.2% K2O and 70% total organic matter) and a compose mineral fertilizer included 15-15-15. The experiment was designed completely randomized plots in blocks with three replications. Soil water was monitored by neutron meter and pumpkin water requirement was determined by soil water budget. Drip irrigation system was use to irrigate pumpkin. Effects of these various fertilizers on pumpkin fruit number per plant, fruit mean weight, fruit yield, 1000-seed weight and plant water consumption were not found significant. The main purpose of pumpkin farming in Turkey is its seed production and applying various fertilizers significantly affected pumpkin seed yield according to this experiment results. The best seed yield was 1435 kg ha-1 obtained from organo-mineral fertilizer. Using organo-mineral fertilizer in pumpkin farming caused 38% seed yield increases. Pumpkin consumed 395 mm water and produced 0.22, 0.36 and 0.27 kg pumpkin seed per consumed 1 m3 water for CM, OM and MF, respectively. Organo-mineral fertilization also considerably contribute water use efficiency.

Keywords: Organo-Mineral Fertilizer, Pumpkin Seed, Water Use Efficiency

**This experiment was supported by Hexagon Solid Waste Management Incorporated Company.*

INVESTIGATING THE EFFECT OF PARALLELISM ON A SPARK-BASED RECOMMENDATION SYSTEM

Akin Ozcift[a], Deniz Kilinc[a], Ozlem Aktas[b], Fatma Bozyigit[c*]

[a]Software Engineering Department, Faculty Of Technology, Manisa Celal Bayar University
[b]Computer Engineering Department, Faculty Of Engineering,Dokuz Eylul University
[c]Computer Engineering, Graduate School Of Natural And Applied Sciences, Dokuz Eylul University

*ftmbozyigit@gmail.com

Abstract:

Generation of various types of data at continuously increasing amounts led to the emergence of big data concept. Further the rapid development of information technology has boosted the volume of data. Big data has become a prominent concept in every branch of digital economy. In the big data world, recommendation systems have become progressively popular as the recommendation system automatically suggests the user best products/services associated with past experiences. Since, the success of a recommendation system is also affected with past experiences of users, the model need to be updated with new data on a regular basis. Apache Spark being one of the scalable big data processing platforms supports batch or stream data processing with various Machine Learning algorithms. In this study, Alternating Least Squares (ALS) Matrix Factorization method of Apache Spark is employed to design and develop a parallel processing based recommendation system. The performance of the system and the effect of the parallelization are evaluated with public MoviLens dataset which contains 45.000 movies, 270.000 users, and 26.000.000 ratings. The experimental results show that Spark's configuration parameters and system parallelization directly affect overall performance of the designed recommendation system.

Keywords: Big Data, Recommendation Systems, Alternating Least Squares (ALS) Matrix Factorization, Apache Spark, Parallelization

*

USAGE OF NATURAL LANGUAGE PROCESSING TECHNIQUES IN SOFTWARE ENGINEERING PRACTICES

Fatma Bozyigit[a*], Ozlem Aktas[b], Deniz Kilinc[c], Akin Ozcift[c]

[a]Computer Engineering Department, Graduate School Of Natural And Applied Sciences, Dokuz Eylul University
[b]Computer Engineering Department, Faculty Of Engineering, Dokuz Eylul University
[c]Software Engineering Department, Faculty Of Technology, Manisa Celal Bayar University

*ftmbozyigit@gmail.com

Abstract:

Natural Language Processing (NLP) is a research area in the field of computer science and computational linguistics. NLP involves methods and approaches to understand and interpret human language in text or speech. Software Engineering (SE) is a discipline including processes, tools and standards to construct software products in the field of computer science. In SE, software development lifecycle (SDLC) is a structured series of phases to develop a target software product. During the cycle, each phase has its own input and output such as requirements, interview notes, bug reports, and test cases. The mentioned blueprints include text data which may be processed with the use of NLP methods. For instance a requirement document is in general transformed manually into a model. This costly process may be automated with support of various NLP approaches. In this work we explored the use of how numerous steps of SDLC benefits from NLP methods. The results of the research show that NLP techniques may help to automate some of the SDLC steps.

Keywords: Natural Language Processing (NLP), Software Engineering (SE), Software Development Life Cycle (SDLC), Systematic Research

*

APPLICATIONS DEVELOPMENT FOR EASY LEARNING OF GEOGRAPHICAL INFORMATION SYSTEMS

Abdurrahman Eymen[a*]

[a]Erciyes University, Dept. Of Geomatics Eng.

*ageymen@erciyes.edu.tr

Abstract:

There are many methods in literature for ensuring higher level of learning efficiencies of students. There is no study on the learning of spatial analysis used in Geographical Information Systems (GIS) in the literature. Therefore in this paper, it is aimed to visualize spatial analyses with animations made in ArcGIS software in order to especially ensure that students understand better spatial analyses used in GIS. Learning of spatial analysis methods used in GIS are difficult issue for both lecturers and students. As a solution method in this study, in order to overcome these difficulties in the teaching of spatial analysis, animations are created in ArcGIS software. For this purpose, "Animation" module was developed in ArcGIS. The effects of these educational animations made for spatial analysis to successes of students are assessed by using Likert type surveys. According to the evaluation of the results, it is seen that the interests of the students to the spatial analysis increase thanks to the proposed method and the students perform the spatial analysis by reaching current data.

Keywords: Geographical Information System, Spatial Analysis, Animation-Based Learning, Digital Elevation Model

*

A NOVEL INTEGRATED APPROACH FOR GREEN SUPPLIER SELECTION BY USING MACBETH AND TAGUCHI LOSS FUNCTIONS

Hacer Guner Goren[a], Ahmet Alp Senocak[a*]

[a]Pamukkale University

*asenocak@pau.edu.tr

Abstract:

By virtue of increasing environmental awareness, customer demands and government legislations on environmental protection, the concept of green supply chain has gained more importance especially since the 1990s. Therefore, firms incorporate environmental approaches into their production processes in order to survive in this tough competitive market. Within the scope, this study focuses on integrating environmental requirements into the supplier selection process since natural resources reach the threshold values and environmental awareness increases day by day. The main purpose of this study is to suggest an integrated approach for solving the green supplier selection problem. The proposed approach consists of two steps. In the first step, the weights of the criteria were obtained by the MACBETH (Measuring Attractiveness by a Categorical Based Evaluation Technique) method. In the next stage, Taguchi loss functions were used to rank suppliers and determine the best one. Furthermore, a sensitivity analysis was conducted to monitor the effect of possible changes on the weights of criteria.

Keywords: Green Supplier Selection, MACBETH, Taguchi Loss Functions

*

CUTTING FORCE PREDICTION FOR END MILLING PROCESS

Yavuz Kaplan[a*]

[a]Pamukkale University

*ykaplan@pau.edu.tr

Abstract:

In all engineering applications, realizing of safe working conditions and generate durable, high quality and economical product and system, the forces affecting the cutting tools and machining centers must be measured correctly and accurately. The modeling and simulation software of machining process provide to researchers simulate of real work conditions without the costs and risks. This paper aims to investigate on utility of finite element model (FEM) using in milling processes. Numerical simulations with finite element model were performed using Deform-3D software. The end milling processes were carried out with carbide end mills at three different cutting speeds, three different feed rates and two different depth of cut. In end milling process, use of lower feed rate, higher cutting speed and lower depth of cut are recommended to obtain minimum cutting forces for the specified test range. The results show that there is a good agreement between finite element analysis and experimental studies.

Keywords: End Milling, Finite Element Model, Cutting Force

*

FREE VIBRATION OF DEFECTED CANTILEVER CARBON NANOROD BY USING NONLOCAL ELASTICITY

Seckin Filiz[a*]

[a]Tekirdag Namik Kemal University, Corlu Vocational School

*sfiliz@nku.edu.tr

Abstract:

In this study, vibration in affected nanotubes is studied. In recent years, after the invention of nanotubes were used in many areas. For example, with the use of nano strain gauge devices, the mechanical properties of the material measurements will be more accurate. Nanotubes are formulated as a rod by using nonlocal elasticity theory and the equation of motion will be replaced by the spring instead of the dislocated atom (affected place). The abnormalities in the vibration behaviour will be examined. It is hoped that the structure will give information about whether it is damaged or not. Affected places (gaps) will be designed as linear springs. With the addition of the spring constant to the carbon nanotube system, the damaged part is formulated. This makes it possible to have an idea about the damage. In this paper, rod equation will be examined. The carbon nanotubes are examined in a regular atomic formulation as nanorod. In this format, considering that the atoms are lined up without cracks and the frequency of the vibration could be solved like a nonlocal rod formulation.

Keywords: Axial Vibration, Carbon Nanotubes, Cracked Rods, Free Vibration, Nonlocal Elasticity Theory.

*

A NOVEL PLANAR RECONFIGURABLE MICROWAVE FILTER DESIGN

Ayse Nihan Basmaci[a*]

[a]Electronics Technology, Tekirdag Namik Kemal University, Corlu Vocational School

*anbasmaci@nku.edu.tr

Abstract:

In this study, a novel planar reconfigurable microwave filter design is presented by using a square loop resonator with inductive slits. The designed filter that can provide basic features such as circuit miniaturization, fabrication simplicity and connectivity simplicity with the help of inductive slits and a single via connection. Reconfigurable circuit feature can be achieved with changes in the single via connection that occurs bandstop-bandpass characteristic variations. In the theoretical analyzes of the designed filter, even-odd mode anlysis method and ABCD matrix synthesis method are used and besides, in the simulation analyzes SONNET SOFTWARE, a full-wave EM (Electro-Magnetic) simulator package program is used. Eventually within the scope of this study, a novel reconfigurable planar filter has been designed and the performance tests has been performed to compare the simulation results and the theoretical analyzes results for the theoretical verification. The simulation and theoretical results of the filter are found to be in harmony with each other.

Keywords: Bandpass Filter, Bandstop Filter, Reconfigurable, Resonator, Microwave Filter

*

AN INVESTIGATION OF INJECTION MOULDED PRODUCTS DEVELOPMENT

Mohamad Sharis Bin Abdul Karim[a*], Hamdan Al Shehri[b]

[a]Higher Colleges Of Technology
[b]Tasnee Petrochemicals

*msharis@hct.ac.ae

Abstract:

This research paper describes a proposal for the methodology or process of injection moulded parts and product development. Plastics i.e. thermoplastics, thermosets and elastomers products market is huge and the global plastics market is expected to reach USD 654.38 billion by 2020 [1]. Injection moulding is the most widely used moulding process for thermoplastics, and in few applications through equipment modifications thermosets and elastomers are also injection moulded [2]. In this paper, an injection moulded part product development process is suggested and two real engineering case studies have been selected and investigated based on the suggested product development process. The first case study studied, proposed and validated the design and processability of an innovative and cost effective High Density Polyethylene (HDPE) industrial pallet design. The design criteria for the pallet were first outlined and iterations of designs were made to achieve and comply with the desired criteria. HDPE industrial pallets need to be designed in such a way it can withstand similar or better static and dynamic loadings than wooden pallets, have high stackability for maximum shipping quantity, consumed minimum volume of plastic materials and have comfortable processing window for injection mouldability. The second case study describes the investigation of failed paint buckets that happened in a paint factory. According to the data provided by the manufacturer, the design and the material of the buckets should be able to absorb the intended design loads. However some buckets in the bottom of the bucket stacks have buckled and raise concerns to the company. Several potential reasons have been presented and investigated. An FEA mechanical load simulation has been designed and run to evaluate different cases and conditions.

Keywords: Injection Moulding, Plastics Cad, Cae, Moldflow, Product Design, High Density Polyethylene

*

INVESTIGATION OF ADSORPTION OF OLEIC ACID FROM SUNFLOWER OIL BY USING AMBERLYST 21 AS AN ADSORBENT

Elif Tumkor[a*], Oguzhan Ilgen[a]

[a]Kocaeli University

*elifeylulbulut@gmail.com

Abstract:

Vegetable oils are called as waste vegetable oils when used several times. The use of vegetable oils in cooking or frying causes physical and chemical changes. The waste vegetable oils are considered as serious environmental pollutant because of their adverse effects on ecosystem. The waste vegetable oils can be converted to biodiesel after transesterification reaction. Biodiesel is presented as an alternative to petroleum based diesel fuel since energy demand is constantly increasing and resources are gradually decreasing in the world. The removal of free fatty acids from waste vegetable oils provides most moderate reaction conditions for biodiesel production when compared with untreated one. Adsorption is an alternative method which provides less energy consumption for removal of free fatty acid from oils compared with other methods like neutralization, extraction and distillation. In the study, Amberlyst A21 ion exchange resin was used to remove of oleic acid from oleic acid–sunflower oil mixtures. The effects of parameters such as temperature, adsorbent amount, and contact time on oleic acid adsorption were investigated.

Keywords: Adsorption, Oleic Acid, Sunflower Oil, Amberlyst A21

*

EVALUATION OF A NOVEL DESIGN FOR IMPROVING THE MECHANICAL PROPERTIES OF CARBON AND GLASS FIBER REINFORCED FILAMENT WOUND COMPOSITE TANKS EXPOSED TO INTERNAL PRESSURES

Ibrahim Fadil Soykok[a*], Umit Safak[a], Hamza Tas[a]

[a]Manisa Celal Bayar University

*ibrahim.soykok@cbu.edu.tr

Abstract:

During the current investigation, the critic region stresses of filament wound composite tanks were intended to minimize by applying a novel geometrical design which involves implementing longitudinally changing thickness of the wall having the same material volume as that of a standard tank structure. The modifications for the establishment of the original design was applied merely on the cylindrical region of the specimens. Consisting of 45°, 55°, 60°, 75°, 90°, five different fiber orientations were numerically investigated. For each fiber orientation, the maximum stress values generated in the original design were found by finite element analysis and those were compared with the corresponding ones generated in the flat cylindrical structure. The analyses were conducted based on both Tsai-Wu and Maximum Stress failure theories which are two most commonly used damage criterias in composites. The obtained results indicates that the original design with varying wall thickness will enable lighter and more durable tank designs, as well as provide material and cost savings.

Keywords: Glass Fiber, Carbon Fiber, Filament Winding, Composite Tank

*

OPTIMIZATION OF MR FLUID POLISHING CONDITION FOR IMPROVING THE SHAPE ACCURACY OF COVER GLASS EDGE

Byung-Chan Kim[a*], Ki-Hyeok Song[a], Jae-Hwa Chung[a], Myeong-Woo Cho[a]

[a]Inha University

*kbc4077@naver.com

Abstract:

According to the minimization of the electronic devices, thickness of cover-glass becomes thinner and the strength of that is stronger. In this reason, the research for the cover-glass that has high strength is ongoing. Generally, the break of glass by external force is occurred from the edge because it is the stress by external force is concentrated. The PV(Peak and Valley) value, which is one of the parameter in surface roughness, can affect to the strength of cover-glass. It is important for high edge strength of cover-glass to develop the grinding and polishing technology for cover-glass edge. Magnetorheological fluid (MR fluid) is a Newtonian fluid that of the viscosity is affected by magnetic field. In this study, MR fluid is used to polishing cover-glass edge for high-precise surface roughness. MR fluid in magnetic field acts as a polishing pad in MR fluid polishing system, not a general grinding or polishing process. For the high-precise surface roughness of cover-glass edge, optimum polishing condition is essentially deducted. To deduct the optimum MR fluid polishing condition, response surface method that one of the design of experiment (DOE) is used. Factors in response surface method are abrasive size, federate and polishing depth and the PV value is a dependent variable. Also, the effect of each factor to the PV value is analyzed using analysis of variance (ANOVA).

It is confirmed that each factor affects to the PV value in 95% confidence interval and it can be found that precise surface roughness can be obtained by optimum polishing condition in MR fluid polishing.

Keywords: Mr Fluid, Mr Fluid Polishing, Cover Glass, Response Surface Method

[*]This work was supported by NRF grant funded by the Korea governmnet(MSIP)(NRF-2015R1A2A2A01005811)

APPLICATION OF MASKLESS LITHOGRAPHY PROCESS FOR MEMS PROBE TIP FABRICATION

Ki Hyeok Song[a*], Myeong-Woo Cho[a], Dong-Wook Lim[a]

[a]Inha Univ.

*khsong@inha.edu

Abstract:

Recently, as the semiconductor industry develops, studies are being made on an inspection system and a micro probe manufacturing technology for testing whether a semiconductor chip is defective. The probe card is a key part of the inspection system and plays an important role in checking the defect by receiving the electrical signal of the semiconductor wafer. Probe tip in Probe card is a part that performs the actual inspection and is manufactured through a mask type lithography process. Such a mask-type lithography increases the cost of manufacturing the mask and the process time, and causes a problem that the production rate is lowered when the mask is contaminated. Accordingly, a process for manufacturing a probe tip through maskless lithography has recently been developed, in which an exposure process is performed without using a mask. In this paper, a MEMS probe tip with a thickness of 45um was designed and its design was verified by structural analysis. Patterns of MEMS probe tip designed by maskless lithography were fabricated and nickel was plated on the patterns fabricated by plating process. The probe tip was completed through the lapping process and the etching process. In order to verify the performance of the finished probe tip, elastic modulus and contact force were measured. The modulus of elasticity of the probe tip made of plated nickel was measured to be 145 GPa and the contact force was measured to be 2.0 gf (minimum contact force) or more. Therefore, we confirmed the applicability of the probe tip fabricated through this process.

Keywords: Maskless Lithography, Manufacturing, Probe Tip, Mems

[*]This work was supported by NRF grant funded by the Korea government(MSIP)(NRF-2015R1A2A2A01005811)

THE PROPERTIES OF YARNS CONTAINING RECYCLE POLYESTER FIBER IN DIFFERENT YARN NUMBER

Seval Uyanik[a*]

[a]Gaziantep University

*uyanik@gantep.edu.tr

Abstract:

Recycling is not new to the textile and apparel industry. Recycling 'refers to the breakdown of product into its raw materials in order for the raw material to be reclaimed and used in new products. In textile when recycling is mentioned, recycle fibers come first. The using of recycle fibers increases day by day in the yarn manufacturing. Cotton and polyester are especially the most common fibers recycled, but other fibers including wool, nylon, and even aramids are being recycled in yarn production. In this study, it is aimed to determine the properties of yarns containing recyle polyester fiber in different yarn number. For this purpose, the yarns containing viscose fiber and recycle polyester fiber were produced at different blend ratios and different yarn numbers. Additionally, pure yarns which made by virgin polyester fiber and viscose fiber were manufactured to compare with these yarns. After, the produced yarns were tested to determine of their physical and mechanical properties considering relevant standards. Test results showed that recycle polyester fibers cause worsening in yarn quality. On the other hand, these negative effects are more clearly observed in terms of yarn physical properties which are unevenness, imperfection and hairiness in comparison to yarn mechanical properties which are tenacity and elongation.

Keywords: Recycle Polyester Fiber, Yarn Manufacturing, Yarn Number, Yarn Properties, Polyester Fiber, Viscose Fiber

*

FABRIC BASED PLAIN HEATERS AS AN INNOVATIVE APPROACH FOR VEHICLE HEATING: A THEORETICAL RESEARCH ON COMPARATIVE PERFORMANCE

Hayri Eren[a*], Volkan Kirmaci[b], Mustafa Erol[c], Yavuz Ozturk[a], Huseyin Duran[b], Ahmet Yavas[c]

[a]Anadolu Isuzu Otomotiv
[b]Bartin Univercity
[c]Izmir Katip Celebi Univercity

*hayri.eren@isuzu.com.tr

Abstract:

Traditionally, almost in all vehicle types, convectional heating method has been used to warm-up passenger compartment air so as to provide a comfortable aurora for the passengers. However, this traditional method has some disadvantages in its own. The major disadvantage of the system may be cited as its cascaded structure. In order to warm up a passenger, the system sequentially requires some steps as; burning the fuel, warming up the coolant, heating coils through pumping coolant and conditioning the cabin air using heated coils. This cascaded and low efficient proses is take longer times owing to the steps of operation. Against traditional heating system, a heating system which located on the interior surfaces of the vehicle interior trim components may provide significant difference on heating performance as well as efficiency and comfort. In this study, an electrical heating system with fabric based plain heating elements with conductive yarns are theoretically investigated as a part of an experimental research project and thermal performance comparison studies will be presented.

Keywords: Fabric Heating, Public Transport Vehicle Heating, Innovative Heating, Noval Heating, Vehicle Electrical Heatin

[*]This research is founded by "The Scientific and Technological Research Council of Turkey" and "Anadolu Isuzu Otomotiv AS."

COMPARISON OF PERFORMANCES OF PARALLEL AND SERIAL CONNECTED COUNTER FLOW RANQUE-HILSCH VORTEX TUBES SYSTEM EXPERIMENTALLY

Volkan Kirmaci[a], Huseyin Kaya[a], Hayri Eren[b*], Fahrettin Gunver[a]

[a]Bartin University
[b]Anadolu Isuzu Otomotiv

*hayri.eren@isuzu.com.tr

Abstract:

Refrigeration is one of the most significant research areas that are strongly relevant to the daily life of human beings. It is the control process of heat transfer. There are significant adverse effects of refrigeration like ozone depletion and global warming because of CFC refrigerants. Consequently, it is very important to use environmentally friendly systems for our universe. A non-conventional system vortex tube is very eco-friendly. It is a mechanical device which uses natural fluids such as air and oxygen as working mediums for refrigeration process. In this study, the vortex tube, having all parts stationary, except the control valve was used in order to arrange volumetric flows, was used in 7 mm inner diameter and 100 mm length counter flow Ranque-Hilsch vortex tube (RHVT). Experimental setup was constituted by connecting two vortex tubes as serial and parallel form. Compressed air was used as a working fluid with inlet pressure range 150 to 500 kPa with 50 kPa variation. Steel and aluminum nozzles were used in the RHVT with nozzle number six. Performance of heating and cooling temperature of a parallel connected counter flow Ranque-Hilsch Vortex Tube was experimentally investigated. Results of the experiments were discussed.

Keywords: Ranque-Hilsch Vortex Tube, Cooling, Heating

*

DEFORMATION OF SOIL AT TUNNEL CONSTRUCTION

Utkan Mutman[a*], Merve Bulut[a]

[a]Kocaeli University

*utkanmutman@gmail.com

Abstract:

A major consequence of the increasing population density in the urban districts is the looming shortage of the available land for new developments. This problem necessitates the utilization of under the ground as well as developing above the ground. With the advent of the technology, below the ground structures have gained importance especially in urban transportation and applications in this field. The most effective among those are the sub-structure buildings and tunneling solutions. Especially in crowded cities, railway and highway tunnels below the ground are among these solutions. The new Austrian Tunnel Building Method was born with the new technology along with the developments in classical tunnel boring methods. The New Austrian Tunnel Building Method is generally more economic and effective in utilizing the support systems in tunnel building. In its broad sense definition, it is based on supporting the newly opened tunnel by the rock structure around it.

In this study we have investigated a station selected in a specified zone of an underground tunnel opened by the New Austrian Tunnel Building Method. By considering the geological properties of the tunnel and engineering applications of the region, the selected station was modelled with PLAXIS 2D program by using the finite element method. After this modelled, deformation was compared. End of the study, the suitable method was offered to decrease deformation.

Keywords: Tunnel, Plaxis, NATM, Fem

*

PERFORMANCE IMPROVEMENT OF AN INTELLIGENT MATERIAL HANDLING SYSTEM

Ridvan Ozdemir[a*], Omer Faruk Argin[b]

[a]Bilecik Seyh Edebali University
[b]Istanbul Technical University

*ridvan.ozdemir@bilecik.edu.tr

Abstract:

Industry 4.0 technologies represent high-level intelligent manufacturing strategies that increase production efficiency and decrease production time. For an instance, one of the most useful Material Handling System (MHS) is Automated Storage and Retrieval System (ASRS), which allows factory owners to enhance operational efficiency and increase productivity. The main aim of this study is to create a simulation platform of a MHS serviced by Rail Guided Vehicles (RGV) to measure possible performance improvements on the MHS. MHS serviced by RGV, which we used in this study, is in the class of Discrete Event Systems (DES). One of the most commonly used method in modeling and analysis of the DES is Petri nets. Petri nets are very efficient for modeling the MHS's dynamic behaviors, especially convenient for real time control implementation. In this study, Petri nets are used for modeling framework. The model is constructed and implemented in MATLAB's Simulink Stateflow environment. An interface is designed in MATLAB's GUI tool for setting system's specific parameters, choosing the type of input load, demonstrating the performance graphs, monitoring the system online and real-time controlling. The RGV's route is divided into 2 zone with an interlocking application for reducing unnecessary movements after the simulation of system was completed and these changes were implemented on the simulation. Finally, the performance of the system for with/without interlocking application are compared with each other according to the performance indices in literature under three different type load inputs which are low, medium and high frequency.

Keywords: Industry 4.0, Intelligent Manufacturing, Stateflow, Rail Guided Vehicle, Material Handling Systems, Petri Nets

*

DETERMINATION OF THE DYNAMIC BEHAVIOR OF A SINGLE DEGREE OF FREEDOM SHEAR FRAME BY VIDEO PROCESSING

Cagla Sekerci[a*], Erdem Damci[b]

[a]Dogus University
[b]Istanbul University

*csekerci@dogus.edu.tr

Abstract:

In recent years, image-processing techniques, which are used in many areas, are also being used frequently in the field of civil engineering. While this technique in nowadays is widely used in a determination of the material properties, it is also used in to determine the dynamic characteristics of the buildings. Image processing technique is a preferred method in laboratory and field studies because of both its lower cost in terms of instrumentation and easiness to implement experimentally. For this reason, in this study, it was aimed to make laboratory experiments on basic building models with the aim of creating a basis for future field studies. A single story shear-frame model with single degree of freedom was used for the examination and three different experiments were carried out on the shear frame. The first experiment is the free vibration experiment, which is generated by giving an initial displacement, and the other two experiments are harmonic and scaled strong ground motions, which were carried out on the shake table. The purpose of the three experiments is to determine the displacements at the shake table level of the building model and the story displacements, to determine the dynamic characteristics of the structure model. For the determination of the dynamic characteristics, three different methods including: the results of the acceleration records taken from the story level and shaking table, displacement curves obtained by video processing technique and theoretical calculations, are used respectively and the results are given comparatively.

Keywords: Video Processing, Dynamic Characteristics, Shear Frame.

[*]This work was supported by Scientific Research Projects Coordination Unit of Istanbul University. Project number, FLO-2017-27219

SELECTION OF REINFORCED CONCRETE FORMWORK SYSTEM WITH MOORA MULTI CRITERIA DECISION MAKING METHOD

Latif Onur Ugur[a*], Engin Yuksel[a], Mursel Erdal[a]

[a]Duzce University

*latifugur@duzce.edu.tr

Abstract:

Reinforced concrete formwork systems constitute an important part of rough construction costs. In this study, the MOORA method was used for Multi-Criteria Decision Making approaches in the decision of procurement of reinforced concrete form system for a construction company. In this way, it is aimed to provide a solution to the problem of selecting the mold system. The MOORA method, which is one of the recommended methods for multi-objective optimization with discrete alternatives, is a method that is successfully used in case of importance. Economically cheap in work, long-term use in the opportunity to use, does not create problems in practice and so on it was tried to choose the mold system which provides the best criteria. In the study, both the Odds Method and the Reference Point Approach were used to calculate. In the results of study; It is understood that the decision model of purchasing reinforced concrete formwork system based on MOORA method can be used in the selection and evaluation of reinforced concrete formwork system in construction companies. The applied model can be used in similar production companies by changing the criteria. It should also be emphasized that the subjective assessment given by the decision maker's intuitions, experience and expertise (expert opinion), not only on numerical values, but on the quantification stages gives the process subjectivity.

Keywords: Reinforced Concrete Formwork System, Multi Criteria Decision Making, Moora Method

*

THE IMPACT OF THE USE OF DIFFERENT SLAB TYPES ON THE ROUGH CONSTRUCTION COST OF THE SAME ARCHITECTURAL REINFORCED CONCRETE BUILDINGS

Latif Onur Ugur[a*], Mursel Erdal[a]

[a]Duzce University, Dep. Of Civil Engineering

*latifugur@duzce.edu.tr

Abstract:

The floor is divided into floors and walked on; to the structural members carrying the loads and their own weight to the supports. Reinforced concrete carcasses convey the loads from the beams to the beams, the loads coming on the beams to the columns, the columns and all the loads on the foundation. Among these structural elements, the upholstery can be designed in many types according to the desired characteristics. In this study, it is aimed to compare the rough building costs when four different twenty four-story buildings with the same architectures use different types of flooring. For this purpose, the architectural project prepared previously was utilized. Also IDECAD program was used for modeling of buildings. Models made are shown in figures. The cost analyzes were compared taking into account the rough construction costs. The costs of rough construction elements are calculated according to 2017 Unit Price Ranges of Turkey. According to the analysis results, the building designed with cassette laying; 21.12% from the design with beamed flooring, it was found that it was costly 1.08% from the building which was designed with asphalt flooring using brick as the filling material and 4.76% from the building which was designed with asphalt flooring which used Styrofoam as filling material. The initial investment cost of the upholstery used as the filler brick is lower but the time to be spent according to the asphalt pavement will be much higher. It also means that the building is less subject to earthquake effects because it is a lighter material than the stroreun brick. Straforun will be a more accurate decision to be preferred both in terms of safety and workmanship.

Keywords: Concrete Structures, Upholstery Types, Construction Cost

*

WATER AND YIELD RELATIONSHIP FOR DRIP IRRIGATED PEA IN KAYSERI CONDITIONS

Halil Kirnak[a*], Serhat Uzun[b], Hasan Ali Irik[b], Mehmet Yilmaz[b], Hamdi Ozaktan[b], Mehmet Arslan[b]

[a]Adnan Menderes University
[b]Erciyes University Faculty Of Agriculture

*haliirik42@gmail.com

Abstract:

Growth of pea under irrigated conditions in Kayseri and effects of irrigation water levels on yield and yield components of the pea were investigated. The experiment was designed as a completely randomized block design with three replications in the Erciyes University Agricultural Research and Application Center in 2016. There was 6 different irrigation treatments such as 0% (I0-dry), 25% (I25), 50% (I50), 75% (I75) and 100% (I100-full irrigation) under drip irrigation system. Irrigation was initiated when the 40% (±5) of available water in the root zone was consumed. Irrigation schedule was based on replenishment of 100, 75, 50, 25, and 0% of soil water depleted from 60 cm soil depth with 5-day irrigation intervals. The applied irrigation water and seasonal crop evapotranspiration rate varied between 35- 254.4 mm and 234.5-525.0 mm, respectively. The seed yield varied between 95.90 and 374.20 kg/da. The results indicated that the pea in the semi-arid conditions could be irrigated with drip irrigation system with 5-day irrigation intervals under I75 treatment

Keywords: Pea, Irrigation Water Levels, Deficit Irrigation, Drip Irrigation

*

EFFECTS OF DIFFERENT IRRIGATION LEVELS ON OIL AND FATTY ACID COMPOSITION OF PUMPKIN SEEDS

Halil Kirnak[a*], Hasan Ali Irik[b], Oya Sipahioglu[b], Ali Unlukara[b], Mehmet Yilmaz[b]

[a]Adnan Menderes University, Faculty Of Engineering
[b]Erciyes University Faculty Of Agriculture

*haliirik42@gmail.com

Abstract:

Despite several oil sources, soybean, date, rapeseed and sunflower are commonly used as oil crops. Although pumpkin seeds are quite rich in oil composition, it is not used much in human nutrition and industrial practices. This study was conducted over the experimental fields of Erciyes University Agricultural Research Center in 2016. Experiments were conducted in randomized blocks design with 3 replications. There were 6 different irrigation treatments as of I0, I20, I40, I60, I80 and I100. And effects of irrigation levels on oil content and fatty acid composition of pumpkin seeds were investigated. While there were significant differences in oil contents of irrigation treatments ($p<0.05$), the differences in fatty acid compositions were not found to be significant. Oil contents varied between 58.3-63.8%. While linoleic, linolenic, oleic, stearic, palmitic and meristic acid were investigated, linolenic and meristic acid were not encountered in pumpkin seeds. The average concentration of palmitic, stearic, oleic and linoleic acids ranged between 10.8–12.62%, 9.12–10.4%, 39.55–44.51% and 32.37–35.03%, respectively.

Keywords: Pumpkin Seed, Irrigation, Oil Content, Fatty Acid Composition

*

DETERMINATION OF POTENTIAL NUTRITIVE VALUE OF TURKISH SORGHUM (SORGHUM BICOLOR L.) LANDRACE

Mahmut Kaplan[a*], Selim Bozkurt[a], Ridvan Temizgul[b], Mehmet Fatih Yilmaz[c], Hasan Kale[d],Yusuf Murat Kardes[a], Ersel Tal[a], Taner Akar[e]

[a]Department Of Field Crops, Faculty Of Agriculture, University Of Erciyes, Kayseri, Turkey
[b]Department Of Biology, Faculty Of Science, University Of Erciyes, Kayseri, Turkey
[c]East Mediterranean Transitional Zone Agricultural Research Of Institute
[d]Department Of Crops And Animal Science, Bogazliyan Vocational School, University Of Bozok, Yozgat, Turkey
[e]Department Of Field Crops, Faculty Of Agriculture, University Of Akdeniz, Antalya, Turkey

*mahmutkaplan5@hotmail.com

Abstract:

Sorghum is resistant against adverse condition like high temperature, drought, salinity and pH. It is a C4 crop with low input and high photosynthetic activity. Therefore, it is commonly cultivated all around the world and it is fifth significant cereal worldwide. This study was conducted for animal feed traits characterization of Turkish sorghum landraces (156 landrace and 4 cultivars) and to develop materials to be used in further sorghum breeding studies. Sorghum grain samples were ground to pass 1 mm sieve mill and made ready for chemical analysis. Crude protein, ADF, NDF, crude oil, condense tannin and crude ash were investigated. Experiments were conducted in randomized complete blocks design with three replications. Sorghum genotypes had a significant (P≤0.01) effect on the parameters studied in the current study. Experimental results revealed that crude protein ratios of 138 landrace (>%8.38), digestible protein ratios of 86 landrace (>%57.38), crude oil contents of 21 landrace (>%2.80), were higher than the values of the greatest standard cultivar. ADF ratios of 20 landrace (<%6.76), NDF ratios of 53 landrace (<%14.63) were lower than the values of lowest standard cultivar. Condense tannin ratios of Turkish sorghum landraces varied between 0.18-3.52% and most of these values were below the damage threshold for animal feeding. Crude ash ratios varied between 1.09-4.39%.

Present finding revealed that several landraces had superior nutritional composition for animals over the standard cultivars. The landrace identified in this study have a potential as a potential to be used as parents in further breeding studies.

Keywords: Sorghum, Genetic Resources, Landrace, Chemical Composition

This research was supported by TUBITAK (Project number: 113O914)

MORPHOLOGICAL CHARACTERISTICS OF NEWLY SELECTED LINES FROM TURKISH SORGHUM LANDRACES

Mahmut Kaplan[a*], Ridvan Temizgul[b], Mehmet Fatih Yilmaz[c], Hasan Kale[d], Yusuf Murat Kardes[a], Ersel Tal[a], Taner Akar[e]

[a]Department Of Field Crops, Faculty Of Agriculture, University Of Erciyes, Kayseri, Turkey
[b]Department Of Biology, Faculty Of Science, University Of Erciyes, Kayseri, Turkey
[c]East Mediterranean Transitional Zone Agricultural Research Of Institute, Kahramanmaras, Turkey
[d]Bozok University, Bogazliyan Vocational College, Department Of Plant And Animal Production
[e]Department Of Field Crops, Faculty Of Agriculture, University Of Akdeniz, Antalya, Turkey

*mahmutkaplan5@hotmail.com

Abstract:

This study was conducted to determine morphological characteristics of newly selected lines from Turkish sorghum (Sorghum bicolor L.) landraces. A total of 150 lines and 4 registered cultivars collected from different gene banks and from the provinces where sorghum is cultivated in Turkey were used as the plant material of the study. Sorghum lines were planted in augmented experimental design in 2015 under ecological conditions of Kayseri province. Common morphological characteristics (plant height, plant diameter, last internode length, flag leaf area, panicle length, flowering period, maturation period, stay green rate, thousand-grain weight, grain yield, glume cover ratio, mid trachea color, plant color, glume color, grain color, husking) were investigated. Significant variations were observed in investigated characteristics.

Among the selected new lines, there were sorghum line with higher grain yields than the standard cultivars, different vegetation durations to be grown in different regions, low glume cover ratios, easy husking and high thousand-grain weight. Further research is recommended to test these newly selected lines for human nutrition and animal feeding. These lines can also be used in further breeding studies to develop new cultivars.

Keywords: Sorghum, New Line, Morphological Characterization

[*]This research was supported by TUBITAK (Project number: 113O914)

A FACILE GROWTH OF CHALCOGENIDES BY SULFURIZATION OF ELECTRODEPOSITED METAL LAYER(S) STACK

Sunay Turkdogan[a*]

[a]University Of Yalova

*sunayturkdogan@hotmail.com

Abstract:

A facile method to synthesize different chalcogenides has been developed and functional materials for solar cell applications were synthesized utilizing this unique strategy. This method relies on depositing metal layer(s) via electroplating followed by sulfurization in an appropriate ambient. In our experiments we have used two different growth paths; one with direct sulfurization of metal layer(s) and the other with oxidation of metal layer(s) followed by sulfurization (so called indirect sulfurization). All these methods were used for the growth of ZnS and Cu2ZnSnS4 (CZTS) materials and their structural, chemical and optical properties were figured out using several characterization methods such as XRD, SEM, EDS, and UV-VIS. By utilizing the aforementioned methods we can easily fabricate a thin film based solar cells which does not contain any toxic materials and composed of abundant materials. It is important to note that this method is very promising when especially the large scale production is our particular interest. Indirect sulfurization was found to produce higher quality materials while direct sulfurization of metal layers leads to grow nonstoichiometric products. The results show that CZTS and ZnS materials were grown with high crystal quality in wurtzite and zincblende structure form, respectively. CZTS materials have 1.49eV direct-band gap energy which is close to ideal for PV application, hydrophilic surface and possess p-type conductivity. By using our method with different material combinations we can fabricate a low-cost thin film-based solar cell. The proposed method is not only applicable to CZTS and ZnS, but also to some other semiconductor materials possessing the potential of optoelectronic applications.

Keywords: Chalcogenides, Solar Cells, PV, CZTS, Zns, Electroplating

*

A VERSATILE METHOD TO FORM 3D PN-JUNTIONS FOR POTENTIALLY HIGHER PHOTON TO CURRENT CONVERSION EFFICIENCY

Sunay Turkdogan[a*]

[a]University Of Yalova

*sunayturkdogan@hotmail.com

Abstract:

A simple but versatile CVD method was utilized to grow any composition of ZnCdSSe quaternary alloy materials in any morphology. The method relies on the temperature-dependent composition deposition and the chemical composition is set by the substrate position (temperature) in a wide temperature gradient. In this work, materials were grown with and without Au catalyst. Since it is hard to achieve high Gibbs-free energy barrier in case of no catalyst materials are grown in thin film form. When Au catalyst is used Gibbs-free energy between Au and solid becomes lower and higher growth rate leads the growth of nanowire materials. We utilized both to form CdSe-rich thin film at the first stage and then CdSe nanowire on top of it. First, thin film is formed and then a thin Au layer is deposited via sputter coater. Au sensitized CdSe thin film substrate was placed at the same temperature (560°C) region to grow nanowires on top of it. As a result, paddle comb-like structures were obtained. In order to characterize the structures several characterization methods were carried out and those show that our materials are grown with high crystalline quality in wurtzite form and possess wide range tunable bandgap energy. It is important to note that those materials are inherently grown in n-type and by depositing p-type layer on top of paddle comb-like layer, we can create 3D pn-junctions. It is crucial to form this type of structures for solar cells fabricated by materials with low diffusion length because generated electrons and holes with low diffusion length cannot reach to the junction and lost after recombination. However, with our proposed method carriers can always find a short-path in lateral direction to reach the junction and therefore the solar conversion efficiency could be boosted for 3D pn-junctions compared to the planar pn-junctions.

Keywords: Thin Film, Nanowires, Zncdsse, 3D Pn-Junctions, Solar Cells, PV, Cvd

*

IMPORTANCE OF PROBIOTICS IN DAILY DIET

Seniz Karabiyikli[a*]

[a]Gaziosmanpasa University

*senizkarabiyikli@hotmail.com

Abstract:

Nowadays, consumers prefer to consume natural, safe, nutritive and also functional foods. Functional foods could be simply described as a food group consumed as part of a usual diet and has beneficial effects on health beyond the nutritive characteristic. The increasing demand on functional foods results in their extended utility and it is also important for the food industry. Probiotic foods are constituted an important part of functional foods. There are lots of studies on health benefit of probiotic bacteria consumption. The positive contributions could be basically reviewed as; lactose hydrolysis in lactose-intolerant individuals, resistance to enteric pathogens, reducing toxic compounds from bacterial growth, anti-carcinogenic and anti-mutagenic activity, anti-hypertensive effect and immune system activation. When the results of these studies considered it was concluded that consuming probiotics a part of daily diet prevents lots of risks. Additionally, consuming probiotic products with targeted therapeutic benefits can be a tasteful and pleasurable way of healthy life. The maternal vaginal and intestinal flora constitutes the source of probiotic bacteria, which colonizes the intestine of the newborn. After infancy probiotics are supplied by some foods (fermented foods) and/or probiotic supplements (pharmaceutical products). Dairy products and dairy beverages have long been considered as important vehicles for the consumption of probiotic bacteria.

Most of conscious consumers are convinced that they should consume probiotics in their daily life. However, the main question in consumer's mind is the probiotics should be consumed as pharmaceutical products or in food products. The advantages and disadvantages of both way of consumption should be considered. This review study could be contributive for confused consumers and also for food industry that produce the probiotic foods to provide and keep their beneficial effects.

Keywords: Functional Food, Probiotic Foods, Healthcare.

*None

INACTIVATION OF MICROORGANISMS IN FOOD MATERIALS BY COLD PLASMA TECHNOLOGY

Seniz Karabiyikli[a*], Aslihan Demirdoven[a]

[a]Gaziosmanpasa University, Faculty Of Engineering, Department Of Food Engineering

*senizkarabiyikli@hotmail.com

Abstract:

Thermal food processes have some adverse effects on food quality, such as losses of nutritional value and sensorial properties. And these adverse effects end up with marketing problems. For these reasons, alternative non-thermal food processing techniques are gaining popularity. Several non-thermal food processing techniques, including pulsed electric fields, high pressure, ultrasound, irradiation and etc. have been evaluated for inactivation of microorganism in food products. One of the novel non-thermal processing technologies is cold plasma technology. In recent years cold plasma applications has rapidly expanded into application of food materials. The advantages of this technique are (i) uniform treatment, (ii) low temperature application, (iii) short processing time, (iv) does not require chemicals and also don't leave toxic residues. It uses energetic, reactive gases to inactivate contaminating microorganism on fruits, vegetables, meats, poultry, water and packaging materials. During last decades, cold plasma reactions also establish efficient inactivation of micro-organisms (bacterial cells, spores, yeasts and moulds), and inactivation effect on Staphylococcus aureus, Salmonella enteritidis, Escherichia coli, Bacillus subtilis, Pseudomonas aeruginosa, Saccharomyces cerevisiae, Candida albicans, Aspergillus niger in food materials has been studied. The microbial inactivation is based on the damage of DNA in chromosomes. Cold plasma aided deposition of bioactives and antimicrobials can be available for edible films and active packaging. In this study, microbial inactivation mechanism of cold plasma technology and their effects on food preservation is reviewed.

Keywords: Cold Plasma, Food, Microorganism, Microbial Inactivation.

*

CREATING STABLE AND VERSATILE THIN ORGANIC FILMS/CITRATE-CAPPED GOLD NANOPARTICLES STRUCTURE FOR SENSORS APPLICATIONS

Ali Yesildag[a*]

[a]Kafkas Universty

*aliyesildag@yahoo.com

Abstract:

Electrochemically modified electrodes surfaces with monolayer of organic films have recently become an immensely attractive materials in electronic and sensors devices. On the other hand gold nanoparticles have been center of interest in applications of materials of electric and optics because of their unique electrical, optical and magnetical properties. These two important structure as combine with a common point to produce new materials will undoubtedly make a great contribution.

In this work, we aimed to synthesize gold nanoparticles on organic molecules modified surfaces that are stable and versatile thin films materyals for sensors aplications. Firstly, electrode surfaces such as glassy carbon and silicon were covalently modified with pyridine molecules by using electrochemical reduction of the 4-aminopyridine diazonium salt. Secondly Au nanoparticles were synhesized on this surfaces which is including amine grups, also strong and covalently modified. The properties of the modified films were investigated using voltammetric methods. The barrier properties of modified electrodes surfaces were studied by cyclic voltammetry in the presence of redox probes (Fe(CN)63- and Ru(NH3)63+). Characterization and morphological surfaces analysis were examined by X-ray photoelectron spectroscopy (XPS) and scanning electron microscopy (SEM). Finally, films/citrate-capped gold nanoparticles structure were examined for application of sensors by using electrochemical methods.

Keywords: Pyridine, Citrate-Capped Gold Nanoparticles, Diazonium Salt, Sensors.

[*]*This study was supported by the Scientific Research Projects Commission of KAFKAS UNIVERSITY (Project numbers: 2016-FM-14).*

COVALENT MODIFICATION OF SI (111) ELECTRODES BY THIN ORGANIC FILMS FOR CHEMICAL SENSORS APPLICATIONS

Ali Yesildag[a*]

[A]Kafkas Universty

*aliyesildag@yahoo.com

Abstract:

In this work reports on an preparation of covalent modified of thin organic films on Si (111) electrodes. The covalent modified organic thin films on Si (111) are prepared by a easy method. Firstly, synthesis of 4-aminobenzylamine and 5-aminophenanthroline diazonium salt. Secondly, covalently modification of benzylamine and phenanthroline thin films on Si (111) electrodes by using electrochemical aryl diazonium modification method. Si (111) electrodes which modified by phenanthroline and benzylamine thin films are characterized by using electroanalytical and spectroscopic techniques. The properties of the modified thin organic films on Si (111) electrodes are investigated by using voltammetric methods. The barrier properties of modified Si (111) surfaces are studied by cyclic voltammetry in the presence of redox probes (Fe(CN)63- and Ru(NH3)63+). Also the films of characterization and morphological analysis were examined by scanning electron microscopy (SEM). Afterwards, covalently modified of thin organic films on Si (111) electrodes is tested for chemical sensors by using electrochemical methods.

Keywords: Phenanthroline, Benzylamine, Covalent Modification, Diazonium Salt, Chemical Sensors.

[*]*This study was supported by the Scientific and Technological Research Council of Turkey (TUBITAK), with a project number:116Z085*

PARKING NEAREST TO LIGHT TRACKING VEHICLE WITH MICROPROCESSOR-BASED SMART PARKING SYSTEM

Rukiye Uzun[a*], Abdullah Cihad Ugur[a], Bayram Aran[a], Murat Sarikaya[a], Irem Senyer Yapici[a]

[a]Bulent Ecevit University

*rukiyeuzun67@gmail.com

Abstract:

With the increasing number of vehicles in the cities, the needs of the drivers for the parking spaces have increased and the intelligent parking systems developed have contributed to the solution of this problem. In this study, it was aimed that the drivers would identify the nearest free parking area on an area and, as soon as possible, determine the appropriate parking place with less fuel consumption. In this direction, a smart parking system designed to be installed in open or closed areas has been established. Drivers coming to the car park entrance in the designed system; the number of vacant parking spaces is displayed on an information screen, as well as the nearest parking is provided by means of light emitting diodes (LEDs). In addition, in case of emergencies such as possible fire in parking lots, in order to expel the drivers quickly from the car park area, the entrance and exit barriers are opened with audible warning and the evacuation routes with LEDs are drawn.

Keywords: Smart Parking System Arduino, Automatic Parking

*

BREAKFAST PLATE DESIGN WITH STEP MOTOR CONTROL

Irem Senyer Yapici[a*], Rukiye Uzun[a], Emrah Demir[a]

[a]Bulent Ecevit University

*senyerirem@gmail.com

Abstract:

In this application study, it was aimed that the individuals within the food departments of big corporations could get the food they wished at their own direction without walking round the table. A breakfast plate, which would be conveniently used in daily life, was designed with this aim. Designed breakfast plate comprised of four segments and four buttons were placed at each edge of the table on behalf of these four zones. Thus, when the button is pressed, the desired part of the plate is brought to the front of the individual. Step motor was used for performing rotational movement of breakfast plate at an intended direction. The control of step motor was carried out with Arduino. Apart from Arduino, ULN2003 integrated unit was used for motor driving step. Therefore, desired segment was brought right to the individual by pressing the button from any edge of the table at an intended direction.

Keywords: Arduino; Breakfast Plate; Step Motor

*

SORPTION, DIFFUSIVITY AND PERMEABILITY PROPERTIES OF POLYMER ACTIVE PACKAGING FILMS INCORPORATED NISIN AND CHITOSAN

Sevgin Diblan[a*], Burcu Gokkaya Erdem[b], Sevim Kaya[b]

[a]Adana Science And Technology University
[b]Gaziantep University

*sdiblan@adanabtu.edu.tr

Abstract:

Sorption and diffusivity properties of 2 different active (LDPE/polyamide/LDPE-2%chitosan (CTS-film) and nisin (N-film)) and control films (LDPE/polyamide/LDPE) were investigated using dynamic vapor sorption analyzer (DVS) at 25°C. GAB and Peleg was found to be the best equation to describe sorption behaviors among other models (Oswin, and Halsey equations). Moisture diffusivity (D) of the films was examined from sorption data at each step of RH range studied. It was found that D values of the N-films were lower than that of control films while D values of CTS-film were similar, especially the difference was important at higher RH's than 60% RH for N-film. This could be explained with nisin adsorbs moisture so the diffusion of moisture was decreased. The N-film had lower permeability and higher solubility values indicating the amount of moisture distributed in polymer films but not passed, it could be hold by antimicrobial agent, therefore while permeability and D values of N-films were lower comparing with those of control and CTS-film; solubility was found to be higher. On the other hand chitosan has been well known for a high compatibility with other component incorporated with films. This can be the reason why D values of control and CTS-film were not significantly different.

Keywords: Active Packaging, Sorption, Diffusion And Permeability

*

APPLICATIONS OF RESPONSE SURFACE METHODOLOGY TO OPTIMIZE PRODUCT DEVELOPMENT IN EXTRUSION COOKING IN CEREAL TECHNOLOGY

Burcak Ucar[a], Sevgin Diblan[a*], Mehmet Sertac Ozer[b]

[a]Adana Science And Technology University
[b]Cukurova University

*sdiblan@adanabtu.edu.tr

Abstract:

This review discussed the recent application of response surface methodology (RSM) for products manufactured from cereals. RSM is a statistical method that is combination of mathematical and statistical theories is useful to improve, develop and optimize processes. RSM is used widely in food industry especially in cereal technology which is a one of major branch of food engineering since working area of cereal technology is suitable for formulation of new products. The primary consideration for selecting and eating a food commodity is the product's palatability or eating quality and secondary is nutrition and wholesomeness. Extrusions combines several unit operations including mixing, shearing, conveying, heating, puffing and partial drying, depending on the extruder design and process conditions and RSM helps optimize these quality factors and conditions with minimum trial and expenses. The advantages of extrusion cooking that are widely used to produce expanded snacks, modified starches, baby foods, pasta etc. are versatility, high productivity, low cost, consumer acceptable product shapes, high product quality and product of new food with no undesirable result. In studies, central composite rotatable design has been frequently preferred and they had been concluded that the central composite design and response surface methodology enabled the determination of optimal operating conditions considering R2, adj-R2, pre-R2, Adeq. precision, PRESS, and CV (lack of fit > 0.1; R2 > 0.94; adj- R2-pre-R2 < 0.2; max. PRESS; CV < 10; pre-R2 > 0.7; Adeq. precision > 4). Some researchers have been used central composite face-centered design which exclude axial points in design and eliminate rotatability of design. There are lots of studies interested in extrusion cooking optimization and these continue increasingly since there are lots of factors can be changed according to techniques and RSM has been successful to obtain high quality product in terms of researches criteria.

Keywords: Extrusion, Response Surface Methodology, Optimization

*

POTENTIAL APPLICATIONS OF CEPHALARIA SAPONINS IN INDUSTRY

Suheyla Kirmizigul[a*], Veysel Umut Celenk[b], Nazli Sarikahya[a]

[a]Department Of Chemistry, Faculty Of Science, Ege University
[b]Center For Drug Research And Development And Pharmacokinetic Applications, Ege University

*suheyla.kirmizigul@ege.edu.tr

Abstract:

Nowadays great interest has been shown to saponins and their pharmacological, chemical and industrial properties. Their surfactant properties and biological activities proved the commercially significance of saponins with expanding applications in food, cosmetics, and pharmaceutical sectors. Saponins also have agricultural usages because of their antifungal and insecticidal effects1-2.

Saponins are a diverse group of compounds distributed in the nature and in Cephalaria species. This genus (Caprifolicaeae) has 94 species which widely spread out in Mediterranean Region3. Furthermore, Cephalaria species have many activities such as antimicrobial, antifungal, hemolytic, immunomodulatory and cytotoxic activities4-7.

This study provides the properties and applications of Cephalaria hirsuta and Cephalaria procera saponins with special focus on their purification and characterization. The most biologically active extract was examined by suitable chemical and chromatographic methods (CC, VLC, MPLC, HPLC, GC-MS). The structures of the compounds were identified by further spectroscopic and chemical studies (1D 2D NMR, HR ESIMS). This is the first report for these species.

Keywords: Saponins, Cephalaria, Industrial Applications

*2015/ FEN/061

CYTOTOXIC, IMMUNOMODULATORY AND HEMOLYTIC ACTIVITIES OF SAPONINS

Nazli Sarikahya[a*], Ayse Nalbantsoy[b], Suheyla Kirmizigul[a]

[a]Department Of Chemistry, Faculty Of Science, Ege University
[a]Department Of Bioengineering, Faculty Of Engineering, Ege University

*nazli.sarikahya@ege.edu.tr

Abstract:

Saponins isolated from a number of plants possess a broad spectrum of biological and pharmacological activities in vitro and in vivo bioassays. The recent investigations and findings on biological activity studies have mostly focused on immunomodulatory, hemolytic and cytotoxic properties of saponins1-3.

Considering the great potential of saponins as bioactive agents, we investigated the cytotoxic, hemolytic and immunomodulatory activities of nineteen triterpenoid saponins and crude n-butanol extracts from the aerial parts of eight Cephalaria species from Turkey, for the first time. HeLa, A549, and a normal cell line HEK293 were used for testing cytotoxicity using MTT method. Immunomodulatory activity was performed in stimulated whole blood cells by PMA plus ionomycin. Hemolytic activity was assessed on human erythrocytes.

As a result, almost all hederagenin and oleanane type saponins displayed significant hemolysis. Monodesmosidic hederagenin type saponins were the most active compounds against lung cancer cells and exhibited greater activity than standard commercial chemotherapy drug doxorubicin. Besides that some saponins induced remarkable IL-1β secretion in stimulated whole blood cells by PMA plus ionomycin4.

Keywords: Cytotoxic, Immunomodulatory, Hemolytic Activities, Saponins

*

COMPARISON OF PREDICTION PERFORMANCE OF DATA MINING ALGORITHMS AND RESPONSE SURFACE EQUATIONS

Hamza Tas[a*], Ibrahim Fadil Soykok[a]

[a]Manisa Celal Bayar University

*hamza.tas36@gmail.com

Abstract:

There are numerous mathematical and statistical models to process data. Data mining is a process used by the researhers to convert raw data to valuable and potantially useful information and consists of there tasks: classification and prediction, clustering and associating rule mining. Classification is a data mining technique and because of its high prediction ability, it is being preffered in many areas. Because of the high cost and time consuming experiments in mechanical engineering, the estimation of results of experiments through data mining will reduce the cost of time and money. Design of experiment (DOE) is a technique that includes recognition and statement of the problem, chose of factors, levels and ranges, selection of response variable(s), chose of design, conducting the experiment, statictical analysis and then drawing conclusion. Box-Behnken design of response surface methodology is one of the type of DOE. Building a regression model (approximation) based on the empirical data is the aim of response surface methodology. In this study, classification methods of data mining such as Multilayer Perceptron and Random Forest algorithms were applied on the experimental data obtained from a present study that deals with the optimal design of soft body armour materials by treating Kevlar fabrics with silica nano-particle based shear thickening fluid. This study also compared these classification algorithms with final response surface equations (regression model) in terms of relative absolute error measure. Results indicated that Random Forest algorithm gave better prediction performance than the others.

Keywords: Prediction Performance, Data Mining, Response Surface Methodology,

*

INVESTIGATION OF FREE MOTION OF FLAP FOR A VERTICAL AXIS WIND TURBINE BLADE

Ilyas Karasu[a], Mustafa Ozden[b*], Mustafa Serdar Genc[b], Khalida Sekhoune[b]

[a]Adana Science And Technology University
[b]Erciyes University

*mustfozden@gmail.com

Abstract:

The scope of this study was to investigate the effect of flap motion on wind turbine blades aerodynamically. In this study, free movement of a flap on horizontal axis wind turbine blade was investigated. Aerodynamic forces generated by flow caused motion of flap. The motion of flap was modelled transiently with use of SixDof and dynamic mesh features via ANSYS Fluent. Time dependent changing of lift and drag forces due to flap motion were obtained. Different cases were carried out in conjunction with different wind speeds and turbulence models. Results were visualized with contours and streamlines. Then, results of turbulence models were compared with each other. Aerodynamic variations both above and at the wake of airfoil was investigated by free motion of flap. Flaps such as in aviation sector was used to control the aerodynamic performance of wind turbine blades. Consequently, it was shown that the flap could use to increase the efficiency of the wind turbine.

Keywords: Flap,Flow Control,Cfd,Wind Turbine

*

IMPROVING CLUSTER ANALYSIS USING K-MEANS BASED AND WEIGHTED CLUSTERING ENSEMBLES

Pelin Yildirim[a*], Derya Birant[b]

[a]Manisa Celal Bayar University, Department Of Software Engineering
[b]Dokuz Eylul University, Department Of Computer Engineering

*pelin@cs.deu.edu.tr

Abstract:

Clustering ensemble integrates multiple clustering models to improve the quality of the results of individual clustering algorithms. The study presented in this paper demonstrates the ability of obtaining consistent, reliable and accurate clustering results provided by this paradigm. Considering this motivation, it investigates different K-means based clustering ensembles to determine the best way for building an ensemble (i.e., ensemble size, the diversity of the ensemble members, setting the weights). As a result of researches, this study proposes a novel clustering ensemble approach that use k-means algorithm with different parameters, named wEKDIM (weighted Ensemble K-means with Distance and Initialization Methods). wEKDIM runs K-means algorithm many times with different distance metrics (Euclidean and Manhattan) and different initializations (Random, K-means++, Canopy and Farthest first) and then combines all of the available clustering partitions to get the final clustering result using a weighted consensus function. We believe that our approach is the first attempt to design a cluster ensemble in such a way. In the experimental studies, the proposed K-means based clustering ensemble was tested on 18 different real-world datasets which are well-known and broadly used in machine learning. The results show that the proposed k-means based ensemble approach (wEKDIM) achieves better clustering performance on average than an individual k-means clustering algorithm in terms of accuracy.

Keywords: Clustering Ensemble, Distance Metrics, Initialization Methods, K-Means, Unsupervised Machine Learning.

*

DETERMINATION OF TURBIDITY IN FILYOS STREAM WATER BY ARTIFICIAL NEURAL NETWORK

Berna Aksoy[a*], Ismail Hakki Ozolcer[a], Emrah Dogan[b], Onur Dundar[a]

[a]Bulent Ecevit University
[b]Sakarya University

*berna.oaksoy@beun.edu.tr

Abstract:

Water is in an endless cycle, which is source of life for human beings. During this cycle, substances that are contaminated in water cause physical, chemical or biological alteration of the water's natural features, that leads to water pollution and therefore causes the environmental balance to deteriorate over time. This quality changes cause deteriorations in ecosystem. For this reason, it is important to investigate the water quality in rivers and water reservoirs which are close to settlement areas. In this study, surface water quality measurements were carried out at downstream of the Filyos stream, which forms the largest sub-basin in the Western Karadeniz Basin, at intervals of thirty days in one year period between September 2015 and August 2016. In the scope of the study, zinc, chromium, calcium, aluminium, manganese and turbidity parameters measured in the laboratory and estimation of the turbidity parameter basaed on parameters of zinc, chromium, calcium, aluminium, manganese was performed by artificial neural networks.

Keywords: Filyos Stream, Heavy Metal, Turbidity, Artificial Neural Networks, Western Karadeniz Basin

*

COMPARABLE STUDIES OF DYNAMIC MAGNETIC AND HYSTERETIC PROPERTIES OF THE ISING-TYPE CORE/SHELL NANOWIRES SYSTEMS*

Mehmet Ertas[a], Ersin Kantar[b], Behiye Bayarbay Kantar[a], Mustafa Keskin[a*]

[a]Erciyes University
[b]Bozok University

*keskin@erciyes.edu.tr

Abstract:

We study and compare the dynamic magnetic properties in a cubic, hexagonal and cylindrical core/shell nanowire within the mean-field theory based on the Glauber-type stochastic dynamics. The cubic, hexagonal and cylindrical nanowires with core/shell morphology are described by the spin-2 Ising particles in the core and the spin-5/2 Ising particles in the surface shell. We investigate the influence of the exchange interaction (JS) and crystal-field (DS) in the shell on dynamic magnetic properties of theses systems. In particular, we study the thermal behavior of total magnetizations and hysteresis loop properties. We found that for small values of JS, the Curie temperatures are very high for the cylindrical nanowire (CIN) system and approximately equal for the cubic nanowire (CUN) and hexagonal nanowire (HIN) and for larger values of JS the Curie temperatures are same for the CIN and HIN in which higher than the Curie temperature for the CUN. Increasing the DS values the Curie temperatures of CIN, HIN and CUN also increase and the Curie temperatures for the CIN higher and the CUN is lower. On the other hand, we always obtain the elliptic shape hysteresis loops for the CIN, CU, HIN and the loop areas are larger for bigger JS and smaller DS values.

* This work was supported by the Scientific and Technological Research Council of Turkey (TUBITAK) (Grant No: 116R004) and Erciyes University Research funds (Grant No: FDA- 2017-7701).

Keywords: Magnetic Core/Shell Nanostructures; Dynamic Magnetic Hysteresis; Mean-Field Theory Based On The Glauber-Type Stochastic Dynamics

[*]This work was supported by the Scientific and Technological Research Council of Turkey (TUBITAK) (Grant No: 116R004) and Erciyes

THE MICROSTRUCTURAL AND MECHANICAL PROPERTIES OF AS-CAST AND MELT-SPUN AL-5ZN-1MG ALLOY

Ercan Karakose[a], Mustafa Keskin[a*]

[a]Erciyes University

*keskin@erciyes.edu.tr

Abstract:

Al-Zn-Mg alloy is one of the aluminum alloys that has been used in many various industrial implementations, such as in automobile applications, aerospace manufacture, weapon and automobile industries due to their high mechanical properties, light weight, good castability and excellent corrosion resistance in most environments. Al-1Zn-2.5Mg alloy was prepared by the conventional casting. They were further processed using the melt-spinning technique with different wheel speeds of (10, 50 and 80) m/s and characterized by the X-ray diffraction (XRD), scanning electron microscopy (SEM) together with energy dispersive spectroscopy (EDS), differential thermal analysis (DTA) and the Vickers microhardness tester. The SEM analysis showed that the conventional solidified samples have a dendritic α-Al solid solution and non-equilibrium phases. On the other hand, the rapid solidified (RS) ribbons showed more homogeneity than that in the conventional solidified samples. The X- ray diffraction patterns for the conventional solidified samples revealed three phases namely, two intermetallic phases (Al12Mg and MgZn2) and the α–Al phase. While no peaks corresponding to the intermetallic phases for the rapid solidified ribbons obtained by 50 and 80 m/s wheel speeds. The melting temperature for the rapid solidified ribbons of 10 and 80 m/s wheel speeds were 654 ºC and 656 ºC, respectively. RS samples were measured using a microhardness test device. The dependence of microhardness HV on the solidification rate (V) was analysed. These results showed that with the increasing values of V, the values of HV increased.

Keywords: Al-1Zn-2.5Mg Alloy, Rapid Solidification, Microstructure, Microhardness.

[*]The part of the work was supported by Erciyes University Research funds, Grant No: FYL- 2017-7348.

A HYBRID MULTIPLE CRITERIA DECISION MAKING APPROACH FOR ACADEMIC STAFF SELECTION

Ahmet Aktas[a*], Billur Ecer[b], Mehmet Kabak[a], Metin Dagdeviren[a]

[a]Industrial Engineering Department, Gazi University
[b]Industrial Engineering Department, Yildirim Beyazit University

*aaktas@gazi.edu.tr

Abstract:

Faculty members, lecturers and research assistants are the academic personnel in universities. Both of these two types of academicians have different responsibilities in educational processes and research activities. Employment of each type of personnel requires to consider different criteria simultaneously and this makes the selection of the best staff to be a complex decision. In such complex situations, multiple criteria decision making approaches are very useful to obtain a compromise decision. In this study, research assistant selection problem is considered. Because of the requirement of considering several decision criteria simultaneously, research assistant selection problem is modeled as a multiple criteria decision making problem. Decision criteria are considered as Graduate Record Examination Score, Language Exam Score, Grade Point Average, Research Experience and University Entrance Exam Rank. Importance degree of these criteria are determined by using AHP (Analytic Hierarchy Process) and applicants are evaluated by using ELECTRE (Elimination and Choice Translating Reality English) methods. A case study in a state university is given to demonstrate the applicability of proposed methodology.

Keywords: Personnel Selection, AHP, Electre

*

A NEW INTEGER PROGRAMMING MODEL FOR INVERSE MULTIPLE CRITERIA SORTING PROBLEM

Billur Ecer[a], Ahmet Aktas[b*], Metin Dagdeviren[b], Mehmet Kabak[b]

[a]Industrial Engineering Department, Yildirim Beyazit University
[b]Industrial Engineering Department, Gazi University

*aaktas@gazi.edu.tr

Abstract:

Multi-criteria sorting problem deals with the assignment of objects to predetermined classes based on a number of criteria. Some applications of this problem can be seen in the field of healthcare systems, production systems and economy. Inverse multi-criteria sorting problem is interested in the assessment of the changes in the states of the objects in order to obtain better classes for objects. The only study in the literature dealing this problem is a binary integer programming model, which is proposed to assess certain actions for the changes to be made on the objects. The main aim in this study is to investigate the effect on classification if the change of object states occurs in integers. So, a new integer programming model is proposed. To test the proposed model, a case study on state hospitals in Turkey including four criteria (number of doctors, number of nurses, number of beds, number of medical devices types) is conducted. The results show that the proposed model can support decisions of healthcare system managers in determining improvement policies.

Keywords: Inverse Multi-Criteria Sorting Problem, Integer Programming, Health Systems

*

AN OPTIMIZATION MODEL FOR PRODUCTION PLANNING IN AN INTERNATIONAL CHEMICAL COMPANY

Sema Demiray Kirmizi[a], Murat Colak[a], Gulsen Aydin Keskin[a*]

[a]Kocaeli University

*gaydin@kocaeli.edu.tr

Abstract:

Conventional production planning aims to provide effective usage of resources such as manpower, material and machine in order to satisfy customer demand. It is aimed to minimize the costs and maximize profit in the production planning process. At this point, inventory and backorder quantities constituting cost items have become significant in this process. On the other hand, since each production environment has its own constraints, it is necessary to develop solution approaches according to these constraints. Mathematical programming models are effectively utilized to solve optimization problems like determination of production quantity and inventory level. This study was realized in an international company operating in the chemical industry. A mathematical model with maximization objective was developed to solve production planning problem for a product group and 6 months period considering production constraints of this company. This model includes 5 decision variables and 8 constraints and has been solved by means of IBM ILOG CPLEX 10.0 in order to find optimal solution for this production planning problem. As a result, optimal production, inventory and backorder quantities have been determined through mathematical programming model.

Keywords: Production Planning, Integer Programming, Mathematical Modelling, Inventory Level, Backorder

*

A STATISTICAL APPROACH OF NI ELEMENT EFFECT ON COST SAVING IN HOT DIP GALVANIZING PROCESS

Ferhat Saday[a*], Sibel Daglilar[a]

[a]Yildiz Technical University / Turkey

*ferhat.saday@windowslive.com

Abstract:

This investigation focused on the nickel effect as well as Ni tablet and Ni powder applications by means of a statistical approach. The Minitab program was used for Multi regression Model, main effect analysis, correlation analysis for the assessment of the parameters. The kettle composition was observed for six months. During this period, about 500 samples with Si content <0,03 % wt. and Si content 0,14<Si<0,25 % weight of steel materials were used. The materials were chosen from the same manner with industrial application, for low silicon (pipes), high silicon (equal angles) were used. The kettle compositions were analyzed with an optical emission device, Ni content in the ash and the dip dross contents analyzed by XRF analyzer. Coating thickness, surface quality and bath parameters such as dipping time, bath chemical content, material types were analyzed with a multiple regression model and statistical methods to be able to have a pattern of coating thickness estimation by the chemical analysis. From this investigation, it showed that Ni powder is more effective compared with the Ni tablet and if lead and bismuth used together, lead could lose its positive effect on coating at the existence of the bismuth.

Keywords: Hot Dip Galvanizing; Nickel Effect; Kettle Composition; Ni Tablet; Ni Powder

*

IN PURSUIT OF CROWDFUNDING PROJECTS SUCCESS CHANCE ESTIMATION USING CORRELATIONAL TOPIC MODELING ALGORITHM

Ramin Khatami[a*], Fatemeh Hassani[a], Morikawa Hiroyuki[a]

[a]The University Of Tokyo

*khatami@mlab.t.u-tokyo.ac.jp

Abstract:

Crowdfunding has become an increasingly important channel for innovators to raise funds and be the ultimate beneficiary of their own innovative ideas. Existing studies have tried to estimate projects funding success based on basic numerical features such as funding goal, duration, word count in project description, etc. . In this work we have investigated impact of similarities between project description text in success chance estimation. Novelty of this research is utilization of correlational topic modeling algorithm which takes into account projects success effect in topics formulation. Our empirical results are based on 28,000 technological projects scrapped from a popular online crowdfunding platform Indiegogo. It shows the combination of our model with small other numerical features in a classification algorithm like support vector machine can improve Area Under the Curve (AUC) of the crowdfunding projects success as much as 11% compared to conventional methods. This works provides evidence that in online crowdfunding platform, users interests gather around projects with certain features. It proves that those features can be effectively extracted by a sophisticated text analytic algorithm without a need on any external source for de-noising of the topics. Findings of this research are beneficial for project owners to better assess the risk involved with the investment of their time and money into a specific project.

Keywords: Crowdfunding, Predictive Modeling, Correlational Topic Modeling, Text Analysis

[*]*This study is supported by Japan Society for the Promotion of Science*

A CFD STUDY OF SEPARATING REATTACHING FLOWS

Taner Cosgun[a*], Ahmet Yurtseven[a], Nurten Vardar[a]

[a]Yildiz Technical University

*tanercosgun@gmail.com

Abstract:

Separation and reattachment of turbulent flows can be seen in many engineering applications and play an important role. Diameter change in internal flows like pipes, combustion chambers or chemical reactors or separation in external flows around cars, foils or buildings create a recirculation region and changes the flow characteristics. The benchmark configuration to observe these type of flows called backward facing step flow. In this study, turbulent flow over backward facing step is numerically investigated via computational fluid dynamics. Flow field is simulated as 3D and time dependent. governing equations (Reynold Averaged Navier Stokes Equations) are discretizated using finite volume approach. First, numerically obtained results are comprised and validated with experimental ones, then the flow conditions are changed to examine the variation of separation zone. Velocity and pressure fields are reported as a result of separating behavior in different conditions. Besides, relation between back-step and practical flows are investigated.

Keywords: Seperating Flows, Computational Fluid Dynamics, Backward Facing Step Flow

*

PERFORMANCE OF ZERO-FORCING RECEIVE BEAMFORMING WITH SIGNAL SPACE DIVERSITY IN THE PRESENCE OF CHANNEL ESTIMATION ERRORS

Serdar Ozyurt[a*]

[a]Faculty Of Engineering And Natural Sciences, Ankara Yildirim Beyazit University

*sozyurt@ybu.edu.tr

Abstract:

This work considers a wireless communication scenario with t and r ($2 \leq t \leq r$) antennas at the transmitter and receiver, respectively. Such a system is known as a t-by-r multiple-input multiple-output system and has the potential to increase the channel capacity by a factor of minimum of t and r without additional bandwidth/time/power resources. One of the spatial multiplexing techniques that can be used for this purpose is zero-forcing receive beamforming (ZFRBF). ZFRBF has the advantage of achieving full spatial multiplexing gain with a relatively low-complexity. However, it is seriously vulnerable to any kind of additive noise and thus offers a limited error performance. As a solution to this problem, we here study a combination of ZFRBF with signal space diversity (SSD) assuming that the number of simultaneous substreams is two. SSD provides error performance enhancement with no extra use of bandwidth/time slots and almost no additional complexity. We examine the performance of ZFRBF with SSD for binary phase shift keying (BPSK) modulation over slow flat Rayleigh fading channels. No channel state information (CSI) is available at the transmitter and the receiver has CSI with channel estimation errors. Such a scenario is quite practical and reflects an important practical impairment. The estimation errors are modeled by using a statistical error model parameterized by the correlation between the actual and estimated channel vectors. We show that the inclusion of SSD increases the immunity of the original ZFRBF system against the noise to a great extent. Moreover, the proposed technique (ZFRBF/SSD) is shown to yield substantial signal-to-noise ratio gains beyond the original ZFRBF scheme without SSD.

Keywords: Multiple-Input Multiple-Output, Zero-Forcing Receive Beamforming, Signal Space Diversity, Channel State Information.

*

SURFACE CHARACTERIZATION OF BORONIZED PURE TUNGSTEN

Ibrahim Gunes[a*], Tayfun Uygunoglu[a]

[a]Afyon Kocatepe University

*3gunes3@gmail.com

Abstract:

In the present study, effect of the boriding heat treatment process on surface properties of pure Tungsten has been investigated. Boriding was performed in a solid medium consisting of Ekabor-II powders at 1123 and 1323K for 2 and 6 h. The boride layer was characterized by optical microscopy, X-ray diffraction technique and the micro-Vickers hardness tester. X-ray diffraction analysis of boride layers on the surface of the steels revealed the existence of WB2, WB3, WB4 and W2B5 compounds. Depending on the chemical composition of substrates, the boride layer thickness on the surface of the Only parameter that changes is boronizing time. Thus, thickness of boride layer changes with boronizing time. WB boride layers ranged in thickness from 16 to 64 µm. The hardness of the boride compounds formed on the surface of the Tungsten ranged from 1584 to 1867 HV0,1, whereas Vickers hardness values of the untreated Tungsten were 128 HV0,1.

Keywords: Pure Tungsten, Boride Layer, XRD, Micro-Hardness

*

THE CHARACTERIZATION OF PACK BORONIZED W-CU BASED TUNGSTEN ALLOY

Ibrahim Gunes[a*], Tayfun Uygunoglu[a]

[a]Afyon Kocatepe University

*3gunes3@gmail.com

Abstract:

In the present study, effect of the boriding heat treatment process on surface properties of 80W-20Cu Tungsten alloy has been investigated. Boriding was performed in a pack medium consisting of Ekabor-II powders at 1073 and 1173K for 3 and 7 h. The boride layer was characterized by optical microscopy, X-ray diffraction technique and the micro-Vickers hardness tester. X-ray diffraction analysis of boride layers on the surface of the steels revealed the existence of CuO, Cu2O, WB2, and WB3 compounds. Depending on the chemical composition of substrates, the boride layer thickness on the surface of the only parameter that changes is boronizing temperature and time. Thus, thickness of boride layer changes with boronizing time. WB boride layers ranged in thickness from 7 to 24 µm. The hardness of the boride compounds formed on the surface of the Tungsten ranged from 1456 to 1694 HV0,1, whereas Vickers hardness values of the untreated Tungsten alloy were 87 HV0,1.

Keywords: W-Cu Based Tungsten Alloy, Boride Layer, XRD, Micro-Hardness

*

A HYBRID APPROACH FOR CAPACITY PLANNING AND PRODUCTION SCHEDULING IN A TEXTILE COMPANY

Semra Tunali[a*], Ezgi Basikoglu Ceryan[b]

[a]Izmir University Of Economics
[b]Jettork Makina A.S.-Hytorc, Izmir, Turkey

*semra.tunali@ieu.edu.tr

Abstract:

Due to an increasing trend towards higher product variety, small lot sizes and shorter lead times, manufacturing companies are forced to utilize their resources as efficiently as possible so that they can remain competitive in the global markets. Increasing the efficiency of production plants requires employing sound methods to deal with capacity planning and production scheduling problem. In this study, a hybrid approach integrating simulation modeling and mathematical programming has been proposed to deal with capacity planning and scheduling problem in a textile company. This research has been motivated by the potential of mathematical programming to provide optimal or near optimal solutions to the capacity planning problem and also by simulation to realistically model the stochastic and dynamic features of a real industrial system. This two-phase hybrid approach was implemented at a leading textile company operating in Izmir, Turkey which produces mostly denim apparel. The manufacturing units of this textile company comprise five departments which are cutting, sewing, washing, quality control and finishing with a total capacity of 100.000 units/month. Among these five departments, the sewing department is the most critical department. Because the amount of time the jobs spend in this department is largest as compared to others. Hence, any efficiency gained in this department will increase the production capacity of the company a lot. Hence, this study has been carried out in the sewing department and the benefits to be gained (i.e., better delivery performance, increased resource utilization) were demonstrated through a case study.

Keywords: Mixed-Integer Linear Programming, Simulation Modeling, Capacity Planning, Production Scheduling, Textile Production

*

COMPARISON STUDY ON LAY-UP CONFIGURATIONS FOR COMPOSITE WIND TURBINE BLADE

Mustafa Serdar Genc[a], Ramazan Ozkan[a*], Burak Karakaya[a]

[a]Erciyes University

*ozkanramazan@erciyes.edu.tr

Abstract:

Wind turbine technologies, one of these new and renewable energy technologies, have begun to develop rapidly. Wind turbines are one of the best ways of solving the world's energy needs. The structural designs of the blades, which play a key role in the wind turbine components and directly affect the energy efficiency of the turbine, are very significant. Generally, the blades of large-scale wind turbines are produced from composite materials. Despite the complicated structures, composite blades can be structurally designed in terms of composite material type, composite layer thickness and number, orientation directions of fibers. In this study, different lay-up configurations for composite wind turbine blade were compared after numerical analysis carried out. In the numerical analysis, ANSYS FLUENT was used for both aerodynamic and structural modeling. In the aerodynamic modeling, the flow over the wind turbine analyzed and pressure distribution over the turbine was obtained. Then, the structural analysis was done based on the pressure distributions. Fiber angle has an effect on strength of the blade. It was concluded that bidirectional lay-up configurations have more strength than unidirectional configurations.

Keywords: Wind Energy, Wind Turbine Blades, Composite Materials, Lay-Up Configuration

*

PERFORMANCE COMPARISON OF LEVY FLIGHT MECHANISM IN DRAGONFLY OPTIMIZATION AND GRAVITATIONAL SEARCH ALGORITHM

Hakan Gulcan[a*], Cigdem Aci[a]

[a]Mersin University

*hgulcan333@gmail.com

Abstract:

Dragonfly Optimization Algorithm (DOA) and Gravitational Search Algorithm (GSA) are heuristic optimization methods which inspired by animals' social behaviors and gravitational force. However, these optimization algorithms can not get good results for some benchmark functions. Some random flight methods have been applied to these algorithms to solve this problem. In this paper, the performance of classical random flight and Levy Flight mechanism is compared on DOA and GSA algorithms to prevent the algorithms from sticking to local minimum of benchmark functions. The comparison is done total of 15 benchmark functions. After applying Levy Flight mechanism to DOA, 12 out of 15 benchmark functions have at least 50% certain success, while 1 is the same with original. After applying Levy Flight mechanism to GSA, 13 out of 15 benchmark functions (with various dimensions and agent counts), at least 60% had a definite success, while 1 had the same result as the original. The results showed that Levy Flight mechanism significantly reduced the problem of premature convergence of flying swarms and the number of sticks to local minimums. Levy Flight has a good ability to expand the field of exploration and to screen the area of exploitation.

Keywords: Levy Flight; Random Flight; Dragonfly Optimization; Gravitational Search.

*

INVESTIGATION OF THE CHANGE OF MECHANICAL AND PHYSICAL PROPERTIES OF AA7075 ALLOY BY RRA HEAT TREATMENT APPLIED AT DIFFERENT TIME AND TEMPERATURE

Gokhan Ozer[a], Ahmet Karaaslan[b*]

[a]Fatih Sultan Mehmet University-Aluteam
[b]Yildiz Technical University

*akaraaslan.ytu@gmal.com

Abstract:

The AA7075 alloy is an important material that is widely used today with its high strength and low weight. The heat treatment of this alloy plays an important role especially in the aerospace industry and high strength parts. T6 heat treatment is applied to give the AA7075 alloy strength, but as a result of this heat treatment, the material becomes susceptible to corrosion. The heat treatment to obtain the corrosion resistance decreases the mechanical strength. At this point, a special heat treatment, called RRA heat treatment, improves both the mechanical and corrosion properties of the AA7075 alloy.

In this study, an AA7075 alloy in T6 condition was retrogated at 180, 280 and 370°C for 1, 30, 50, 90 and 120 minutes. After retrogression, the samples were aged again under T6 conditions. The mechanical properties of the samples were determined by V-Charpy, hardness and tensile tests, and their physical properties by electrical conductivity tests. Microstructures of the samples were determined by light metal microscope and SEM. The results showed that the effect of the temperature and the duration of the RRA on the mechanical and physical properties is related to the precipitates at the grain boundary.

Keywords: AA7075, RRA, Mechanical Properties, Physical Properties

*

A RESEARCH FOR DISPOSITION OF MAKING INNOVATION AMONG DEPARTMENTS

Murat Oturakci[a*]

[a]Adana Science And Technology University

*moturakci@adanabtu.edu.tr

Abstract:

With the advancement of information technology, innovation term has started to become focus point in industries. Companies have started to pay attention to innovation management with continuous research in development and improvement. Since, innovation management practices have become vital for companies, the necessity of contribution of all departments became critical. The aim of this study is to examine the relationship between the disposition of making innovation and the level of innovation performance achievement of company departments in Adana, Turkey. According to the objective, comparisons have been made among 300 white collars of 12 departments of 4 companies in Adana province. Effect of the parameters of employees such as age, gender, education level and duration of work on disposition of making innovation have been observed through hypothesis. Hypothesis of the study are analyzed with t test, Chi-Square and correlation tests with the help of SPSS. According to the results, there is a significant relationship between disposition of making innovation and the level of innovation performance achievement among departments as well a significant relationship between disposition of making innovation and the parameters which have been selected for the study.

Keywords: Innovation, Innovation Performance, Disposition Of Innovation.

*

PREDICTION OF R&D BUDGETS WITH TIME SERIES ANALYSIS METHOD

Murat Oturakci[a*], Cansu Dagsuyu[a]

[a]Adana Science And Technology University

*moturakci@adanabtu.edu.tr

Abstract:

R&D studies in industry have great emphasis on the development of science and technology. To conduct R&D studies, besides of knowledge, budget, employee and equipment are needed. Each of those necessities creates certain costs to companies. Every public or private company determines their own R&D budget for following years and performs their activities according to that certain budget. The objective of this study is to predict R&D budgets of companies, since it plays a key role for the development of companies. In this study, R&D activities were divided into three different sectors, financial and non-financial companies, state and higher education institutions. R&D cost items are divided into two groups as current (employee and other) and capital (machine and fixed) expenditures and those items are predicted with time series analysis model. Mean error, mean absolute error and root mean square error are used as performance measurements of the models. According to the results of the study, prediction models are available to use for R&D budget determination. In this way, those models play as a guidance role for R&D budget for next years.

Keywords: R&D, Budget, Time Series Analysis, Prediction

*

INFLUENCE OF DIFFERENT SI LEVELS ON MECHANICAL PROPERTIES OF ALUMINIUM CASTING ALLOYS

Onur Ozaydin[a*], Alper Kaya[a]

[a]Cevher Wheels

*oozaydin@cevherwheels.com

Abstract:

AlSi7Mg and AlSi11Mg are the most commonly used materials in aluminum alloy wheel production. The main difference is the heat treatment application; for wheel production AlSi7Mg is usually used in heat treated form while AlSi11Mg is not. Heat treatment processes play a vital role on production costs. More than fifty percent of aluminum wheels are heat treated however the exact value varies between different manufacturers. Additional heat treatment costs directly affect the competitiveness of the manufacturer. In this study the material properties of an alternative Si level between AlSi7Mg and AlSi11Mg is examined and the effects of these intermediate Si levels on mechanical properties is are compared with that of AlSi7Mg and AlSi11Mg. The aim of this study to examine the possibility of obtaining mechanical properties of heat treated AlSi7Mg with a non-heat-treated material differing only in Si content. In this experiment all processes and casting parameters for different material types are the same except for the Si content. In addition to an experimental study, the mechanical properties of the alternative material are simulated by utilizing a material analysis software and these properties are compared with experimental results. Thus, correlation between simulation and experimental study results can also be examined.

As a conclusion, the alternative non-heat-treated material is presented to manufacturers. These results may be used to bypass the heat treatment process and to decrease the cost of final product.

Keywords: Aluminum, Heat Treatment, Mechanical Properties, Simulation Of Material Properties

*

THE MECHANICAL PROPERTIES OF SR MODIFICATION ON ALUMINIUM CASTING ALLOYS

Onur Ozaydin[a*], Alper Kaya[a], Elvan Armakan[a], Ender Yildirim[a]

[A]cevher Wheels

*oozaydin@cevherwheels.com

Abstract:

Al-Si based alloys are commonly used in aluminum alloy wheel production. Inoculant materials such as Antimony (Sb), Sodium (Na) and and Strontium (Sr) modify the structure from a course structure to a finer one. Antimony (Sb) and Sodium (Na) may cause occupational health and safety and holding time problems. On the other hand Strontium (Sr) is commonly used in industry as an inoculant material in Al-Si based alloys and Sr modifies not only silicon particles but also transforms phases in morphology, hence Sr modification leads to better mechanical properties. On the other hand, high amount of Sr causes porosity in the structure and the average grain size is increased proportionally with higher Sr levels.

In this study different Sr levels are examined to obtain an optimum result regarding mechanical properties and chemical composition. After the calculation, the correlations between mechanical properties and material characterization are examined. Holding time after the modification affects the mechanical properties. In the second part of this study different Sr holding time levels are evaluated to see the effect on mechanical properties.

As a conclusion the optimum Sr modification level and optimum holding time after modification are presented. Optimization of process parameters may be helpful to researchers working on modification in aluminum alloys.

Keywords: Alsi7, Sr Modification, Holding Time, Metallurgical Properties, Material Characterization

*

PROPERTIES OF BOARDS MADE FROM WOOD/COTTON WASTE MIXTURES

Omer Umit Yalcin[a*], Halil Turgut Sahin[a], Isa Yavilioglu[a]

[a]Suleyman Demirel University

*omeryalcin@sdu.edu.tr

Abstract:

Cotton waste, which is formed during the processing of high added textile products from cotton plants and expressed as waste, is mixed with red pine wood chips at certain rates by adding 10% (w/w) by thermoset synthetic Urea-formaldehyde (UF) resin. The mechanical and physical properties of boards were determined according to approriate standards. It was clearly realized that the presence of cotton waste in boards structure causes some level improve and/or lowering particular properties of boards. The highest MOR and MOE values of 15.07 N/mm2 and 1773 N/mm2 were found for boards that manufactured with 60:40 wood chip/cotton waste (percentage by weight). However, the highest internal bond strengths of 0.29 N/mm2 was observed with boards of 50:50 wood chip/cotton waste (percentage by weight) boards. In general, the lowering wood chip contents could effects decrease IB values approximately 10.7-21.4%.

It is realized that valuable cellulosic cotton waste could be useful for production of various type composite materials alone or as wood substitute with mixture of red pine wood chips. However, there is a need to understand more clearly the structural and mechanical changes that take place in the boards made from mixture of wood and cotton waste. So, understanding the fundamental change and strength properties of that type of boards may open the possibility to increase utilization of cotton waste.

Keywords: Red Pine, Cotton Waste, Particle Boards, Strength Properties, Cellulose

*

PINE LITTLE NEEDLES: ITS PROPERTIES AND POTENTIAL UTILIZATIONS

Omer Umit Yalcin[a*], Halil Turgut Sahin[a]

[a]Suleyman Demirel University

*omeryalcin@sdu.edu.tr

Abstract:

The pine trees (Pinus spp.) are one of the most abundant genus of conifers in Northen hemisphere and widespread distribution all over the World. However, the needles apperance and physical structure varies markedly between the different pine species (i.e. bundled, spiral, linear, colored, small to large, short to long, etc.) and is often crucial for the identification of species of pines. Moreover, the pine species typically bear 1-5 needles that are arranged in groups and that are bundled together form a fascicle. It has already evaluated as used for pharmaceutical purposes, ornament materials, energy sources, environmental pollution indicator and various valuable material potantial. Some important findings have already been reported in literature. Hence, the vast of literature on coniferous needles has already been reviewed and pointed by a number of researchers. Some excellent bibliographies provide a thorough index to the literature on pine little needles. Most studies focus on the anatomical and chemical structures, which depend on the species and have particular characteristics that range from their essential oils and medicinal compounds from some pine needles.

But it is important to note that because of strong competition from other natural materials, markets for needles have not been in great demand. However, efficient pine needle utilization may create a new industry by making a valuable asset out of a waste. In this sense, in this study, the potential use of pine little needles through anatomical and chemical properties, to provide a basis for future applications have been reviewed. Some literature findings have been reviewed and important findings regarding their valuable properties are reported.

Keywords: Pine Needles, Applications, Chemical Properties, Essential Oils.

*

A STUDY ON LINE RATE NEIGHBORING FOR MLR WDM OPTICAL NETWORKS

Gul Boztok Algin[a], E. Turhan Tunali[b*]

[a]Ege University
[b]Izmir University Of Economics

*turhan.tunali@ieu.edu.tr

Abstract:

Due to their high transmission capability, mixed-line-rate (MLR) optical network employing wavelength-division-multiplexing (WDM) on fibers is one of the best candidates to support the increasing traffic volume of communication networks. Since different line rates coexist on different wavelengths of a fiber in MLR networks, in addition to other physical impairments, cross-phase modulation (XPM) effect arises. Studies show that a significant performance penalty occurs for 100 Gbps and 40 Gbps coherent DP-QPSK wavelengths due to XPM induced by adjacent 10 Gbps OOK wavelengths. This problem must be handled during wavelength assignment process. By measuring the performance of a signal by its transmission reach, in order to keep the signal's quality of transmission (QoT) in adequate level, the effective transmission reach of the underlying line rate must be adapted according to other line rates used in adjacent wavelengths of the same fiber. In this work, we study the assignment of neighboring line rates in MLR WDM optical networks. Simulations are carried out to demonstrate the effect of constraining line rate neighboring over routing performance in terms of communication cost and resource utilization. As simulation test bed, Survivable Routing with Rate and Wavelength Assignment (SRRWA) using shared backup path protection algorithm for dynamic traffic model that has been previously developed by the authors is used. The results of constrained strategies are compared with unconstrained wavelength assignment method. Simulation results show that constraining the wavelengths to be assigned for each line rate increases traffic blocking of the network dramatically.

Keywords: Optical WDM Networks, MLR, SRRWA, Survivable Communication, Rate Assignment

[*]this abstract was already submitted by the first author and accepted

AERODYNAMIC BEHAVIOR OF WIND TURBINE AIRFOIL UNDER UNSTEADY WIND SPEEDS

Gamze Genc[a], Burak Karakaya[a*], Mustafa Serdar Genc[a]

[A]erciyes University

*burakkarakaya@erciyes.edu.tr

Abstract:

The studies on renewable energy sources aimed to increase energy efficiency. In order to increase the efficiency of a wind turbine, it can be increased lift coefficient and decreased drag coefficient of the blade and the wind speed is one of the parameters that affect these coefficients. Stable and higher wind speeds affect the wind energy output. In this study, aerodynamic performance of the blade was numerically investigated under instantaneous changing wind speeds. Unsteady wind speeds were obtained in Pinarbasi region of Kayseri and this wind speeds were introduced with user-defined function (UDF) to FLUENT CFD programme. Time dependent solutions were used in numerical solutions and mesh independence was considered. NACA 0012 symmetric and NACA 2412 chambered airfoils were used for wind turbine blade. The results were showed that the cambered blade airfoil oscillated more than the symmetric blade airfoil. It was observed that instantaneous changes in wind speeds significantly affected the lift and drag coefficients.

Keywords: Wind Spedd,Aerodynamic Performance,Numerical Analysis

[*]This work was supported by the project of FYL-2017-7683 by Erciyes University Scientific Research Projects Institution

PRODUCT INNOVATION IN SEWING MACHINES

Emine Utkun Aktener[a*], Nezla Unal[a]

[a]Pamukkale University, Buldan Vocational School, Fashion Design Department

*eutkun@pau.edu.tr

Abstract:

Product Innovation in Sewing Machines

With the globalization in the world the extent of competing is increasing. In these conditions, companies or firms need innovation to be more efficient and productive and to give what is needed from them. Innovation is a concept that has existed for centuries and expresses novelty and creativity. It is known that development and progress without innovation and creativity is not possible. Innovation can be in the features of a product and service, in process or in marketing fields.

Product innovation is the introduction of a product or service that is new or considerably improved in terms of its features or intended uses into the market. Product innovation includes significant improvements/developments in technical specifications, parts and materials, firmware, ease of use, or other functional features.

In this study, the product innovations that sewing machines used in the apparel industry underwent were examined in the historical process.

Keywords: Sewing Machine, Product Innovation, Textile Industry, Apparel Industry

*

A NEW HYBRID STOCHASTIC-DETERMINISTIC OPTIMIZATION METHOD BASED ON FILLED FUNCTION

Ihsan Pence[a*], Melike Siseci Cesmeli[a]

[a]Mehmet Akif Ersoy University

*ihsanpence@mehmetakif.edu.tr

Abstract:

In general, popular methods for solving global optimization problems can be divided into two categories as deterministic and stochastic methods. Both methods have some advantages and disadvantages against each other. The preferred deterministic method as filled function method aims to construct an auxiliary function called filled function via the current local minimizer of the global optimization problem. The better points are located on filled function's basin location and finding this region is difficult with conventional methods, and if the step distance is not very small, the area can't be detected by passing. Also, this procedure costs a lot of time. In this study, a hybrid stochastic-deterministic approach is presented as a faster and more efficient alternative for classic filled function method. Unconstrained global optimization method based on clustering and parabolic approximation (GOBC-PA) used as a stochastic method for accelerating the L filled function method as a deterministic method for searching the basin region. The methods that are used in this study preferred because of their popularity, speed and robustness. The stochastic method's objective function is the epsilon value of the gradient that gives the location of basin region. So, only purpose of the stochastic method is to find basin region, not to find global optimum. The role of finding the global minimum has been left to deterministic method. The developed method has been tested against classical filled function with 11 benchmark functions. All functions have 2-dimension and process repeated 10 times. When the obtained results are examined, it is seen that the hybrid approach has superiority over the mean error, standard deviation and elapsed time values according to the classical approach. These results show that combination of deterministic and stochastic method can be more successful finding the global minimum according to classic deterministic method.

Keywords: Global Optimization , Gobc-Pa , Filled Function

*

COMPARISON OF METHOD A1 AND B OF TENSILE TEST ON ALUMINIUM SPECIMENS

Ramakumar Jayachandran[a*], Christian Weibmuller[b]

[a]Institution
[b]Ifep

*ramakumar.jayachandran@hydro.com

Abstract:

Tensile test is the predominant test method used in extrusion industry to ensure if minimal mechanical properties imposed by the product are met. The two most governing standards to perform the tensile test are the ISO – EN 6892-1 (2016) and the ASTM–E8.16. The new version of the standard IS0 6892-1 (2016) strongly recommends using method A of the tensile test. A set of pre-machined specimen were sent to eighteen different labs to test both Method A1 and Method B of the tensile test. This paper presents the comparison of the test results from the two different test methods. Each method was evaluated for four specific criteria

1.Determination of 0,2 %-proof strength Rp0,2

2.Determination of the tensile strength Rm

3.Determination of percentage elongation after fracture A manually

4.Determination of percentage elongation after fracture A extensomer

The evaluation of the results shows no significant difference between the two test methods on 6061 aluminium alloy.

Keywords: Aluminium, Extrusion, Method A1, Method B, Strain, Stress, Tensile Test.

[*]*Hydro Extruded Solutions*

FACTORIAL DESIGN CONTRAST ANALYSIS BASED IDENTIFICATION OF THE LACTIC ACID BACTERIAL GROWTH IN SAUSAGES STORED AT DIFFERENT TEMPERATURES

Demet Canga[a*], Selin Kalkan[b], Selahaddin Batuhan Akben[a]

[a]Osmaniye Korkut Ata University
[b]Giresun University

*demetcng@gmail.com

Abstract:

In this study, lactic acid bacteria (LAB) growth in vacuum packed sausages stored at 4 and 25 oC during 10 storage days was analysed. Contrast analysis was used as the method for this aim since can ask specific questions on demand. So, the temperature, storage days and interactions were evaluated by means of the contrast estimates that correspond to specific questions identified with bidirectional factorial design. The R software was used for the implementation of method. Factors determined in the method are temperature and storage days. According to the results of ANOVA with contrast analysis, it was determined that the increase in temperature (4 0C or 25 0C) significantly affected the change of LAB amount ($p < 0.01$). Also, the effect of LAB growth depending on storage period increases as quadratic ($p < 0.01$). Furthermore, interaction between the storage day and temperatures that are 4 0C or 25 0C significantly differentiated (R=0,89) the amount of lactic especially at tenth storage day. Finally, some suggestions have been made about the storage conditions depending on the interaction of temperature and storage day, by means of the findings of study.

Keywords: Lactic Acid Bacteria (LAB) Growth, Factorial ANOVA, Contrast, Sausage

*

DESIGN AND OPTIMIZATION OF AMORPHOUS COMPACT MICROSTRIP ANTENNA USING ARTIFICIAL BEE COLONY ALGORITHM FOR MICROWAVE IMAGING APPLICATIONS

Mustafa Berkan Bicer[a*], Ali Akdagli[a]

[a]Mersin University

*mberkanbicer@gmail.com

Abstract:

In this study, a compact microstrip antenna with a relatively small in size and a non-symmetrical shape that can be used alone or as a part of an antenna array in ultrawideband microwave imaging applications is designed and optimized using the artificial bee colony algorithm to perform a good ultrawideband bandwidth characteristics. The design and simulations of the designed microstrip-fed monopole antennas, with outer size of 40 x 50 mm2 on an FR4 substrate with permittivity of 4.3 and a thickness of 1.5 mm, are utilized with the use of a full-wave electromagnetic simulation software based on the moment method (MoM). As a result of the optimizations made using the artificial bee colony algorithm, two different antenna designs with broadband performance were obtained. The return loss (S11) results show that the characteristics of the proposed antennas meet the bandwidth requirements and offer good performance for applications operating between 3.1 GHz and 10.6 GHz, covering the entire ultrawideband frequencies.

Keywords: Antenna, Design, Microstrip, Microwave Imaging, Ultrawideband

[*]This study was supported by the Research Fund of Mersin University in Turkey with Project Number: 2017-1-TP3-2190.

INVESTIGATING THE CORROSION BEHAVIOUR OF AA6060 ALLOY IN NAOH-NA2SIO3 SOLUTION

Alptekin Kisasoz[a*]

[a]Yildiz Technical University

*akisasoz@gmail.com

Abstract:

Aluminium alloys have been widely used in automotive and food packaging industries owing to their relative lightness, specific strength, and corrosion resistance in the various environments. The mechanical properties of the AA6XXX alloy increase with age hardening process by the formation of intermetallic particulates in the matrix structure. Unfortunately, these particulates have a negative influence on the corrosion resistance of AA6XXX alloy. Especially, the corrosion resistance of the AA6XXX alloys decreases drastically in alkaline media. Also, inhibitors can slow down the corrosion rate of aluminium alloys in alkaline media. In this study, corrosion behaviour of AA6060-T6 alloy in NaOH solution is investigated. Corrosion tests are carried out in 0.01 and 0.1M NaOH and, sodium silicate is used as an inhibitor to slow down the corrosion rate of AA6060 alloy in NaOH solutions. Moreover, Corrosion properties are determined by measuring weight loss of the samples and also, pH values of the solutions.

Keywords: Aluminium, Aging, Corrosion

*

THE EFFECT OF PREFORM PREHEATING ON MICROSTRUCTURAL AND MECHANICAL FEATURES OF 80% CP-TI REINFORCED A356 MATRIX COMPOSITE

Ridvan Gecu[a*], Ahmet Karaaslan[a]

[a]Yildiz Technical University

*ridvangecu@gmail.com

Abstract:

Commercially pure titanium (CP-Ti) reinforced A356 aluminum matrix composites were fabricated by melt infiltration casting. Nearly same sized CP-Ti sawdusts were assembled under 440 MPa pressure to procure one-piece preforms with 20% porosity. The vacancies of the preforms were filled by molten A356 alloy in a plaster mould at 700°C under -105 Pa vacuum atmosphere. CP-Ti preforms were preheated in a plaster mould for 0, 30, 60 and 240 minutes before infiltration to determine the effects of preform preheating on microstructural and mechanical features of manufactured composites. A356 alloy was melt at 790°C in an electrical furnace for casting operation. After melt infiltration casting, A356 matrix composites containing 80% CP-Ti reinforcement were successfully manufactured. Produced specimens were characterized by light optical microscopy, scanning electron microscopy and micro-Vickers hardness measurements. TiAl3 intermetallic phase was obtained at Al/Ti interfaces of 0 and 240 min preheated samples. Oxide film formed during preheating acted as a barrier to Al diffusion and only mechanical bonding was observed for 30 and 60 min preheated specimens. Excessive preheating caused thicker oxide film which was broken because of its increasing brittleness when it was exposed to molten A356 alloy during casting. Due to broken oxide film, Al alloy diffused in Ti part and TiAl3 phase was formed for 240 min preheated sample. The average TiAl3 hardness of 0 and 240 min preheated samples was calculated 474 and 507 HV0.01, respectively.

Keywords: A356 Alloy, Commercially Pure Titanium, Melt Infiltration Casting, Composite

*

DRY SLIDING WEAR PROPERTIES OF AA7075 ALUMINUM MATRIX HYBRID COMPOSITES

Ridvan Gecu[a*], Serhat Acar[a], Alptekin Kisasoz[a], Kerem Altug Guler[a], Ahmet Karaaslan[a]

[a]Yildiz Technical University

*ridvangecu@gmail.com

Abstract:

304 stainless steel (SS) and commercially pure titanium (CP-Ti) reinforced AA7075 aluminum matrix hybrid composites were manufactured by melt infiltration casting under vacuum atmosphere. Various SS and CP-Ti contents (at the ratios of 3:1, 1:1 and 1:3) in AA7075 alloy were studied and the effects of SS/CP-Ti ratio on wear resistance of produced composites were investigated. All casting operations of Al alloy were performed at 830˚C. Produced composites were characterized by light optical microscope and pin-on-disc type tribometer with using 6 mm diameter Al2O3 counterpart under 10 N load during 100 m sliding distance. Reaction phases were formed at both Al/CP-Ti and Al/SS interfaces. Double-layered intermetallic compound (IMC) was formed between AA7075 and 304 SS alloys whereas monolayer IMC was obtained at Al/CP-Ti interface. Formation of hot cracks in SS/Al interface was occurred while good metallurgical and mechanical bonding was observed between Al matrix and CP-Ti reinforcement. With increasing SS amounts in composite structure, wear rates were slightly decreased. In spite of increased hot crack formation at the interface, the best wear resistance was obtained in 75% 304 SS and 25% CP-Ti reinforced AA7075 matrix hybrid composites because double-layered IMC between AA7075 and 304 SS was more resistant to wear than that of monolayer IMC at Al/CP-Ti interface.

Keywords: AA7075 Alloy, Commercially Pure Titanium, 304 Stainless Steel, Melt Infiltration Casting, Hybrid Composite, Wear

*

COOLING SLOPE CASTING AND THIXOFORGING OF A319 ALLOY

Serhat Acar[a*], Kerem Altug Guler[a]

[a]Yildiz Technical University, Department Of Metallurgical And Materials Engineering

*seacar@yildiz.edu.tr

Abstract:

Semi-solid metal forming techniques have become more remarkable in recent decades due to advantages of both process and product properties. This technique principally relies on feedstocks with non-dendritic microstructure and well-studied for common aluminum casting alloys like A356 and A380 which are used for diverse industries such as automotive, aviation and marine. In order to obtain globular microstructure different routes are developed and these routes can be classified in two different branch: liquid metal and solid state routes. In this study, cooling slope casting, which is one of the liquid metal route, were chosen as feedstock production method for A319 alloy and a copper tube with the length of 650 mm is used as a cooling slope without water circulation. Castings were carried out at 635 °C and the tilt angle was 60° for copper tube. Obtained billets were cut into pieces with 40 mm height. One specimen was kept as reference without being exposed to any further treatment. Two specimens for each reheating time were reheated at 585 °C for 20, 40, 60 and 80 minutes. One of the each duplicates was quenched in water in order to freeze the present microstructure and the other one was thixoforged with 50% deformation via a hydraulic press. Microstructural investigation was performed with the evaluation of spheroidization index and average globule size for every sample. Brinell hardness test was carried out to examine the relation between microstructure and mechanical properties. Reheated for 40 minutes and quenched sample displayed the highest spheroidization index with 0,951, which is one of the most important feature for thixoforming feedstocks. On the other hand, maximum hardness value was observed on the sample with 20 minutes reheating time due to finer microstructure.

Keywords: Thixoforging, A319, Cooling Slope Casting

*

INVESTIGATION OF THE EFFECTS OF SOLUTION HEAT TREATMENT TIME ON EUTECTIC SILICON FOR A356 ALLOY

Serhat Acar[a*], Ridvan Gecu[a], Alptekin Kisasoz[a], Kerem Altug Guler[a], Ahmet Karaaslan[a]

[a]Yildiz Technical University, Department Of Metallurgical And Materials Engineering

*seacar@yildiz.edu.tr

Abstract:

In this research microstructural variations for A356 aluminum casting alloy were examined with different casting methods and different solution heat treatment time. Permanent and green sand moulds were used for casting processes which were carried out at 730°C. Effects of different cooling rate which arised from different mould type and solution heat treatment time have been investigated with the variations on microstructures and hardness values. Cast samples were solution heat treated at 525 °C for 3, 6 and 12 hours to observe the effects of solution heat treatment time on different casting methods. All specimens including as-casts were undergone metallographic preparation and all microstructures were evaluated in terms of determining secondary dendritic arm spacing (SDAS) for as-cast specimens and differentiations on aspect ratio of eutectic silicon for heat treated samples. Brinell hardness tests were carried out on each sample in order to relate the hardness property with microstructural variations. SDAS values were found higher in specimen cast into green sand mould than the other specimen cast into permanent metal mould due to slower cooling rate and thusly displaying lower hardnes value. Maximum hardness and the lowest aspect ratio values were obtained with solution treatment time of 3 hours for both mould type.

Keywords: A356 Aluminum Alloy, Solution Heat Treatment, Eutectic Silicon

*

STABILIZING KAOLINITE CLAY WITH LIQUID POLYMER RESIN

Altug Saygili[a*], Gozde Turan[a], Ezgi Kirmizi[a], Elif Vargun[a]

[a]Mugla Sitki Kocman University

*altugsaygili@hotmail.com

Abstract:

Ground improvement techniques are widely used as an alternative method to replace the unsuitable material on site. Various techniques for soil stabilization are used to reduce the settlements of the structures, to improve the shear strength and thus increase the bearing capacity of shallow foundations, to increase the factor of safety against slope failures and to reduce shrinkage and swelling of soils. Usage of liquid polymers as chemical stabilizers in soil stabilization is growing in recent years. Liquid melamine formaldehyde resin is used in this study to improve the mechanical performance of the kaolinite clay samples. Laboratory experiments are conducted to evaluate the effects of liquid polymer addition to the clay samples compacted at the optimum moisture content. Liquid melamine

formaldehyde resin is added at dosages of 0, 3, 6, 9 and 12% by weight to kaolinite clay samples and compacted with miniature Harvard compaction device at standart compaction energy and cured for 3, 7, 14 and 28 days. Control and stabilized samples were subjected to unconfined compression tests after curing to determine the strength increase with different curing times and polymer ratios. The results indicated that liquid melamine formaldehyde resin improved the

strength of kaolinite clay samples up to 6 times.

Keywords: Liquid Polymer, Kaolinite Clay, Soil Stabilization, Unconfined Compressive Strength

*

MODELING OF LACTIC ACID BACTERIA CONCENTRATION AND STORAGE TIME DEPENDENT STORAGE TEMPERATURE OF EMULSION TYPE SAUSAGES USING ARTIFICIAL NEURAL NETWORKS

Selahaddin Batuhan Akben[a], Selin Kalkan[b*], Demet Canga[c]

[a]Osmaniyekorkut Ata University, Bahce Vocational School, Department Of Computer Technologies
[b]Giresun University, Faculty Of Engineering, Department Of Food Engineering
[c]Osmaniye Korkut Ata University, Bahce Vocational School, Department Of Food Processing

*selin.kalkan@giresun.edu.tr

Abstract:

Emulsion type sausages tend to deteriorate faster due to high pH and water activity even if many vegetative cells can be inactivated by the cooking process since they may be contaminated depending on the slicing packing and peeling period. In emulsion type sausages, lactic acid bacteria (LAB) often create a predominant flora and some heterofermentative types can even continue to grow at low temperature storage conditions after the growth happened at high temperatures. So, the LAB growth at product storage temperature is important in terms of shelf life and consumability. Therefore, an average of past storage temperatures must be determined by the measured LAB values and storage time dependent model result to determine whether the storage conditions are sufficient or not. For this reason, this study suggests an artificial neural network (ANN) model that can predict the average of past storage temperature of vacuum packed sausages and the model inputs are storage time and measured LAB concentration. The LAB concentrations of vacuum packaged sausages were measured at 4 and 25 °C along 10 days of storage time in the experiment to determine the ANN model inputs and control outputs. In other words, the measured LAB concentrations and storage period were considered as independent variables of experiment while the storage temperatures considered as the dependent variable. Thus, the LAB concentration values and storage time were entered as input to ANN while the storage temperature values as output. The determination coefficient 〖(R〗^2) of proposed ANN model with single neuroned hidden layer was 0,91. Also, the easily applicable model equation with few parameters were suggested since the determined best ANN model has a single neuron hidden layer.In addition, an image matrix is also provided by trying the possible input values with ANN to visual determination of average storage temperature related to combinations of LAB concentration value and storage time. As a result, it was determined and suggested the average of past storage temperature of the product can easily be predicted by means of the LAB concentration value and storage time dependent ANN model that can be improved by more temperature values to be measured in the experiments.

Keywords: Lactic Acid Bacteria, Artificial Neural Network, Modelling, Sausages

*

EVALUATION OF WASTE MARBLE USAGE IN BITUMINOUS MIXTURES

Ismail Cagri Gorkem[a*]

[a]Mugla Sitki Kocman University

*cagrigorkem@mu.edu.tr

Abstract:

In recent years, developments in global economy and increasing in commercial activities cause high amount of heavy vehicle traffic on existing roads. This leads to early deformations in the flexible pavements by decreasing the expected service lives and levels. It is necessary to build new highway networks due to these commercial developments. Nowadays, researchers have been working on alternative sources because of the limited resources for construction of road pavements. It is known that during the mining processes of marble, a large amount of waste material occurs. The created waste marble disposal sites cause harmful effects on environment and change the topography of the land; thus, they also create visual pollution. With the increasing environmental awareness in recent years, instead of opening new stone quarry sites, the utilization of waste materials in bituminous mixtures has gained importance. It has been thought that waste marble aggregates, which structurally resemble to limestone aggregates, can be used in bituminous mixtures. For this purpose, the performance of bituminous mixtures prepared with two different types of aggregates (limestone and marble aggregate) has been evaluated. In this sense, traditional bitumen tests have been applied on B50/70 classified virgin binder and the properties of both limestone and marble aggregates have been determined. The performances of bituminous mixtures prepared with both limestone and waste marble aggregates have been specified by the help of Marshall Stability and Flow Test. It has been determined that the results obtained are promising.

Keywords: Waste Marble, Flexible Pavement, Bituminous Mixtures, Calcite.

*

GUIDELINES FOR PRELIMINARY DESIGN OF WAVE BARRIERS

Deniz Ulgen[a*], Onur Toygar[a]

[a]Mugla Sitki Kocman University

*denizulgen@mu.edu.tr

Abstract:

Wave barriers have recently become an efficient solution for reducing the ground borne vibrations disturbing people living inside units. The main logic behind the use of those barriers is scattering and diffraction of Rayleigh waves by solid obstacles. A good deal of research has focused on the isolation performance of open and in-filled trenches through numerical analyses. However, there is very limited numerical study validated with full-scale experiments. In the present study, field tests are performed to investigate the screening efficiency of wave barriers and the findings are used in the verification of finite element model. Results of the experimental and numerical analyses are compared with the literature data and special emphasis is given to specify the parameters affecting isolation performance of wave barriers. Thus, it is intended to provide guidelines for the preliminary design of wave barriers.

Keywords: Wave Barriers, Rayleigh Wave, Trench, Scattering

[*]The research leading to these results has been funded from Mugla Sitki Kocman University BAP-Project Code 17/080

MHD FLOW AND HEAT TRANSFER OVER A RADIALLY STRETCHING DISK

Anuar Ishak[a*]

[a]Universiti Kebangsaan Malaysia

*anuarishak001@gmail.com

Abstract:

The first study on the flow over a stretching plate was done by Crane in 1970, where an exact solution to the Navier-Stokes equations was reported. The industrial applications in this stretching plate/sheet problem are arising in polymer industry, manufacturing of plastic and rubber sheet, glass glowing, continuous casting and spinning of fibres. On the other side, Wang in 1990 pioneered the boundary layer flow over a shrinking plate, where a specific unsteady shrinking film solution was discussed. Different from the stretching case, the shrinking sheet has a unique character which features with a reverse flow in the boundary layer that would create a complexity. There are two conditions where the solutions of the flow towards a shrinking sheet is possible to exist, having an adequate suction imposed on the boundary or creating a stagnation flow.

In the present study, we investigate the effects of suction on the radially stretching or shrinking disk. The governing partial differential equations are first transformed to a set of ordinary differential equations by a similarity transformation, and then is solved numerically with the help of MATLAB software. It is found that the magnetic and suction effects are more pronounced for the shrinking case. Magnetic field increases the skin friction coefficient but decreases the local Nusselt number. Both the skin friction coefficient and the local Nusselt number increase as suction increases.

Keywords: MHD, Shrinking, Disk, Heat Transfer, Dual Solutions

*

WELDING OF AA7075 TO GALVANIZED STEEL BY COLD METAL TRANSFER METHOD

Hulya Durmus[a], Nilay Comez[a*]

[a]Manisa Celal Bayar University

*nilay.comez@cbu.edu.tr

Abstract:

The need for hybrid structures gains importance especially in vehicle industry in order to provide lightness. Hybrid structures of metals can be built by detachable joints or welding processes. The common problem in welding of dissimilar materials lies behind the formation of intermetallic phases and different thermal and electrical properties of these materials. In this study, cold metal transfer welding was applied to obtain AA7075-galvanized steel joints. The effect of heat input on tensile strenght of dissimilar joints and on thickness and mechanical properties of intermetallic layer was investigated. Formation of intermetallic phase layer was observed by microstructural investigations. Intermetallic phases were identified by SEM-EDX and XRD analyses. Mechanical properties of AA7075-galvanized steel joints were determined by tensile testing. Hardness and elastic modulus of intermetallic phases were determined by nano indentation technique. The outcomes showed that increasing heat input increased the intermetallic layer thickness and tensile strength. However, brittle fracture occurred in intermetallic layer between aluminium and galvanized steel due to the increasing layer thickness.

Keywords: AA7075, Steel, Welding, Intermetallic, Nano Indentation, Strength

[*]This study was supported with the project of TUBITAK215M623 by The Scientific and Technological Research Council of Turkey

A COMPERATIVE STUDY ABOUT THE FE-C-CR AND FE-CR-C-B BASED FLUX CORED WIRES USED IN HARDFACING

Hulya Durmus[a], Canser Gul[a], Melis Yurddaskal[a], Nilay Comez[a*]

[a]Manisa Celal Bayar University

*nilay.comez@cbu.edu.tr

Abstract:

Present study aimed to investigate the abrasive wear resistance of hardfacing coatings that were produced by open arc welding using Fe-C-Cr and Fe-Cr-C-B based flux cored wires. A powder mixture consisting of 10% FeB and 90% FeCr powders was also added during the welding process. Hardfacing coatings contains 70 % flux cored wire + 30 % FeCr-FeB powder mixture. Hardness test and microstructural investigations were applied to understand the wear mechanism of coatings. The hardness of coating produced with Fe-Cr-C-B based flux cored wire was found to be higher than that of Fe-C-Cr based flux cored wire. Dry sand/rubber wheel abrasion test was carried out according to ASTM G-65 standard. Surfaces were examined by SEM after abrasion test. The results showed that the flux cored wire with boron exhibited better wear resistance than the flux cored wire without boron. The outcomes of hardness test in association with the wear test shows that, increased coating hardness has a great influence on abrasive wear resistance.

Keywords: Hardfacing, Wear, Abrasion, Hardness

*

A SUCCESSIVE SIDE-PEAK ELIMINATION TECHNIQUE FOR UNAMBIGUOUS BOC SIGNAL SYNCHRONIZATION IN GLOBAL NAVIGATION SATELLITE SYSTEMS

Eunyoung Cho[a], Keunhong Chae[a], Seokho Yoon[a*]

[a]Sungkyunkwan University

*syoon@skku.edu

Abstract:

Recently, binary offset carrier (BOC) modulation has attracted much attention in global navigation satellite systems (GNSS) such as GPS, Galileo, GLONASS, and BeiDou, since it provides a higher degree of accuracy in positioning than that of the conventional binary phase shift keying modulation. One of the most critical tasks in BOC-based GNSS receivers is the synchronization in phase between the received and locally generated BOC signals, where the received BOC signal is first correlated with the locally generated BOC signal with different phases in a serial or in a parallel way, then the maximum is chosen among the correlations corresponding to each of the phases, and finally, the phase associated with the maximum is determined to be that of the received BOC signal. Therefore, the correlation peak (corresponding to the maximum correlation) plays a very important role in synchronization. The correlation functions of BOC-modulated signals have a string of side-peaks around the correlation peak, and thus, the channel impairments such as the white noise and multi-path interference often cause the synchronization to be achieved not at the correlation peak but at one of the side-peaks, eventually leading to a significant error in positioning, which is the major technical issue in BOC-based GNSS receivers. In this paper, thus, we propose a successive side-peak elimination scheme, where the highest side-peak is first eliminated by subtracting its estimate from the correlation function, and then, the remaining side-peaks are successively eliminated based on the ratios of each of the remaining side-peaks to the highest side-peak. Since the proposed scheme is exploiting only inherent components of the BOC correlation function without extrinsic aids, it has a low complexity and is applicable to all types of BOC modulation.

Acknowledgments: This study was supported by Basic Science Research Program through the NRF of Korea under Grant 2015R1D1A1A01057327.

Keywords: Global Navigation Satellite Systems, Binary Offset Carrier, Unambiguous, Synchronization

**This study was supported by Basic Science Research Program through the NRF of Korea under Grant 2015R1D1A1A01057327*

PREDICTION OF THE LACTIC ACID BACTERIA GROWTH CAUSED BY STORAGE CONDITIONS IN VACUUM PACKED SAUSAGES USING POLYNOMIAL SURFACE MODELING METHOD

Selin Kalkan[a], Selahaddin Batuhan Akben[b*], Demet Canga[c]

[a]Faculty Of Engineering, Department Of Food Engineering, Giresun University
[b]Bahce Vocational School, Department Of Computer Technologies, Osmaniye Korkut Ata University
[c]Bahce Vocational School, Department Of Food Processing, Osmaniye Korkut Ata University

*batu130@hotmail.com

Abstract:

Vacuum packaging can resist enough the growth of Pseudomonas spp., however it can not resist enough the growth of lactic acid bacteria (LAB) Brochothrix thermosphacta and Enterobacteriaceae spp. So, the LAB is commonly defined as a bacterial group that deteriorate the vacuum packaged meat products. For this reason, LAB growth in vacuum packaged meat products should be estimated by modeling based on storage time and temperature, to conrol the vacuum packaged sausages. In this study, aim is to prediction of the growth of LAB in vacuum packaged sausages stored at 4 and 25 0C along 10 day storage period from production date, by means of modelling. For this purpose, polynomial surface modeling that R^2 is 0,994 was used and a prediction matrix for possible time-temperature combinations was calculated. By means of model, the predicted values of lactic acid bacteria corresponding to possible combinations of the storage period (between 0-10 days) and temperature range (between 4 and 25 oC) were calculated and placed to 1024x1024 dimensional matrix. Then, the values in the prediction matrix were transformed to the corresponding 1 Mpx and 7-bit grayscale image. Finally, after the visual compatibality of image matrix with experiment was approved, the polynomial surface model and image matrix that represents the relation between the LAB concentration of vacuum packaged sausages and the storage conditions (temperature-time) was proposed for the future studies.

Keywords: Polynomial Surface Modelling, Lactic Acid Bacteria, Sausages

*

DETERMINING THE CONDITIONS FOR SUCCESS OF WART TREATMENT WITH CRYOTHERAPY USING DECISION TREES METHOD

Selahaddin Batuhan Akben[a*]

[a]Osmaniye Korkut Ata University

*batu130@hotmail.com

Abstract:

Warts are small, rough, harmless tumours that occur at the skin. Common, flat, plantar, periungual, filiform, and genital are the clinical appearance of them. They typically disappear spontaneously, but it may take years. Warts respond to a variety of treatment. Immunotherapy with candida antigen and cryotherapy with liquid nitrogen are the best-known wart treatment methods. However, preference of treatment methods by expert is important since these methods have some difficulties. For this reason, the success of methods should be determined before the treatment according to the attributes of patients and disease. In this study, success of cryotherapy method was determined according to the attributes (Sex, age, time elapsed before treatment, number of warts, types of warts, surface area of warts) of patients and warts. Decision trees was used as the success determining method according to the attributes of patients and warts. According to the findings obtained by decision trees, it was determined that the cryotherapy is successful at 100% for patients younger than 16,5 years of age. Also, it was successful at 100% for patients ages between 16,5-45,5 years that treated within 8,125 months. For other conditions, it was successful at about 10%. In other words, whether the cryotherapy applied to common and plantar warts would be successful according to patient age and disease duration was determined at accuracy 94,44%. Thus, it was suggested that the success of wart treatment methods depending on patient and disease attributes can be determined using data mining methods before the treatment.

Keywords: Skin Disease, Wart Treatment Methods, Disease And Patient Attributes, Data Mining, Biomedical

*

EXPERIMENTAL ANALYSIS FOR THE THERMAL PERFORMANCE OF A DOUBLE PIPE HEAT EXCHANGER WITH SIO2-WATER NANOFLUID

Fatih Selimefendigil[a*], Hakan F. Oztop[b]

[a]Manisa Celal Bayar University
[b]Firat University

*fthsel@yahoo.com

Abstract:

Thermal performance of a double pipe heat exchanger with SiO2-water nanofluid was experimentally investigated. A double pipe heat exchanger with length of 0.5m was considered. SiO2-water nanofluid with various solid particle volume fractions between 0% and 2.5% were used as the hot fluid through the inner tube of the heat exchanger. Experimental analysis was performed for various flow rates and for different inlet temperatures of the nanofluid. Two turbine type flow meters was used to measure the flow rates of the inner tube and annulus while the inlet temperature for the hot water was controlled by using an electrical resistance heater. It was observed that the overall heat transfer coefficient enhances when the solid particle volume fraction of the nanofluid increases. The increment in the mass flow rate of the hot fluid through the inner tube results in overall heat transfer coefficient enhancement. The difference between overall heat transfer coefficient, for water and nanofluid with highest particle volume fraction enhances for higher flow rates of the hot fluid. For flow rate of 0.87 lt/min there is a difference of 20.60% while for flow rate of 2.37 lt/min, the difference becomes 83.26%. There is very slight effect of inlet temperature for the enhancement of the overall heat transfer coefficient when considering nanofluid at different particle volume fractions.

Keywords: Double Pipe Heat Exchanger, Nanofluid, Sio2 Nanoparticles, Heat Transfer Coefficient

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

EFFECTS OF ELLIPTICAL CONDENSER ON THE PERFORMANCE OF A VAPOR COMPRESSION REFRIGERATION SYSTEM

Fatih Selimefendigil[a*], Hakan F. Oztop[b]

[a]Manisa Celal Bayar University
[b]Firat University

*fthsel@yahoo.com

Abstract:

In this study, effects of an elliptical condenser on the performance of vapor compression refrigeration system was examined. Reference configuration was obtained from a refrigerator with having a circular condenser. Thermodynamic analysis by using first and second law of thermodynamics was utilized. Performances were tested on an experimental test rig for various ambient temperatures and for different flow rates of air of the condenser fan. Coefficient of performances (COP) values were found to be higher when elliptical condensers were used instead of circular ones. When the ambient temperature increases, the discrepancy between the elliptic and circular condensers enhances. The difference between two condenser types results in COP enhancements of 2.15%, 17.3% and 20.2% for the ambient temperatures of 25 oC, 32 oC and 40oC, respectively. When the elliptic condenser fan air mass flow rate increases, first law efficiencies were also enhancing. A 15% enhancement in the condenser fan air flow results in 6.94% performance enhancement. Second law analysis of the system with circular and elliptic condensers reveal that total irreversibilities can be reduced for a refrigeration system by using elliptic type condensers. It was observed that a component based improvement in the vapor compression refrigeration system results in energy and exergy performance improvements.

Keywords: Elliptic Condenser, Thermodynamics Analysis, Coefficient Of Performance, Irreversibility

[*]This study is supported by The Scientific and Technological Research Council of Turkey (TUBITAK) for the project no: 5150047 who

CLUSTERING MOODLE USER DATA: A CASE STUDY

Meltem Eryilmaz[a*], Asli Numanoglu Genc[a]

[a]Atilim University

*meltem.eryilmaz@atilim.edu.tr

Abstract:

Rapid development in technology resulted in different versions of blended learning in education. From time to time hybrid, flipped and inverted learning are used as acronyms of blended learning which is a combination of strong aspects of face to face and online education. Learning Management Systems (LMS) are the most important tools in blended learning. Among these LMS systems, Moodle platform is the most widely used environment. Though mostly used, even within the same institutes the efficiency in using Moodle is quite average. In this study the efficiency of usage of Moodle within a large private university located in Ankara, Turkey is evaluated by clustering Moodle users according to their different activities. Clustering is performed by applying Class Analysis method. There are 1541 courses open in Moodle with 14491 contents. Among the registered users 81% are actively using Moodle. As a result of analysis of user data and institution's course database, within the active courses four user groups were identified. Type I includes "Login" with an approximate active usage percentage of 42%, Type II includes "Utilization" with an approximate active usage percentage of 34 %, Type III includes "Sharing" with an approximate active usage percentage of 18%, and Type IV includes "Discussion" with an approximate active usage percentage of 6%. It is seen that though most widely used, users' benefit from Moodle is not still at the desired level.

Keywords: Blended Learning, Moodle, Clustering, Higher Education

*

IMPACT OF TECHNOLOGY BASED LEARNING ENVIRONMENT ON STUDENT PERFORMANCE IN A CIVIL ENGINEERING COURSE

Asli Numanoglu Genc[a*], Meltem Eryilmaz[a]

[a]Atilim University

*asli.genc@atilim.edu.tr

Abstract:

In recent years, technology based learning environments have been efficiently used in higher education. These technologies include such as adaptive learning, flipped learning and blended learning. There are various flexible learning materials such as videos, online recorded lectures, online recorded tutorials, hand written tutorial solutions, discussion board and online practice quizzes. This paper presents a case study on the teaching and learning of CE 471 Integrated Coastal Zone Management (ICZM) Course in the Civil Engineering Department of Atilim University, Turkey. The lecture is introduced by applying blended learning methods. Moodle platform of Atilim University is utilized for blended learning. Course topics are discussed in the lecture material and class times, and students are supported with the online course material, study questions and discussion board on Moodle platform. Different than the previous years, additional weekly videos are included in the platform in the last semester. Based on the data of over 100 students over a 3-year period, it is seen that adding the videos has improved the learning experience of the ICZM students in civil engineering. The overall continuous use of online supporting materials with the videos has increased the students' academic success by 12%. The results of satisfaction score survey applied at the end of each semester have shown almost 90% of the students agree that video supported online materials increase their learning and success in the course.

Keywords: Civil Engineering Education, Technology Based Learning, Blended Learning, Higher Education

*

THE DETERMINATION OF COASTLINE CHANGE USING SUPPORT VECTOR MACHINE IN BERDAN DAM LAKE, TURKEY

Sevim Yasemin Cicekli[a*], Mustafa Hayri Kesikoglu[b], Tolga Kaynak[b], Coskun Ozkan[b]

[a]Cukurova University
[b]Erciyes University

*yoturanc@cu.edu.tr

Abstract:

With the development of technology, new techniques have been developed to measure large areas. Remote sensing technique, which is one of them, is frequently used for monitoring the change of coastline areas. In this study, the coastline boundary changes of Berdan Dam Lake was detected in Mersin, Turkey. The dam lake was constructed between 1975 and 1984 for providing hydroelectric energy, drinking water and irrigation. The coastline boundary changes of Berdan Dam Lake was determined using Landsat 5 TM and Landsat 8 LDCM satellite images belonging to 2000 and 2017 years respectively. In first step, image to image registration process was performed to conform the coordinate systems of images to each other. In second step, each satellite image was classified into two information classes, namely lake and other areas by using support vector machines method. The image classification accuracies were calculated by using post classification comparison method and the changes in coastline boundary were determined by image differencing method. The change image was created with the obtained classification images. It was observed that the lake area decreased while the other areas increased from 2000 to 2017.At the end of the study changes from water to land and from land to water were detected in Berdan Dam Lake.

Keywords: Support Vector Machines, Post Classification Comparison, Change Detection, Landsat Satellite Images, Remote Sensing Technology

*

ICETI

II INTERNATIONAL CONFERENCE ON ENGINEERING TECHNOLOGY AND INNOVATION

www.iceti.org

EUROPE CONGRESS
www.europecongress.org

NATIONAL UNIVERSITY OF PUBLIC SERVICE

UNIVERSITY OF Cincinnati

TURKISH AIRLINES

ZENITH GROUP
www.zenithgroup.ba

CNR GROUP