ICon MEAS

2nd International Conference on Materials Engineering & Science

(IConMEAS 2019)

(Insight on the Current Research in Materials Engineering and Science)

USM MIE UNIVERSITY UniMAP

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Making Drug Discovery

AIP American Institute of Physics

Sika BUILDING TRUST

ELSEVIER

University of Technology
Baghdad – Iraq
September 25-26, 2019

ABSTRACT-BOOK | IConMEAS-2019

2nd International Conference on Materials Engineering & Science

(I*Con*MEAS 2019)

University of Technology Baghdad, Iraq

September 25-26, 2019

The IConMEAS 2019 is the premier forum for the presentation of new advances and research results in the fields of the Materials Engineering and Science. The conference will bring together leading researchers, engineers and scientists in the domain of interest from around the world.

The main objective of IConMEAS 2019 is to provide a comprehensive global forum for experts and participants from academia and Industry to exchange ideas and present results of ongoing research. Researchers and practitioners are invited to submit their contributions to IConMEAS 2019.

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PART 1: HONORARY CHAIR

Prof. Dr. Imad Hussain Merza Al Hussaini

President of University of Technology– Iraq

Within an optimistic scientific atmosphere aiming at redirecting and strengthening the educational process with reassurance to achieve its scientific sobriety towards the reliability of the graduates specifications consistent with the labor market, expressing the will of the productive university according to the need of the community within its private and governmental institutions. This comes according to the Ministry of Higher Education and Scientific Research methods for universities and research centers to adopt and applied research that contestant with society needs, to provide effective solutions by reviewing our study plans and curriculum according to the courses system along with thegovernment program objectives of scientific research. Aiming at setting the optional goal to reach the knowledge and labor economics to ensure knowledge to re-brilliance education, which must be consistent and compatible with the features of the Iraqi mind known for its brilliance, seriousness, loyalty and profundity through what was pointed, stated and declared in many scientific forums, conferences and studies in addition to the international institutions, which many of our Iraqi students have been studied and graduated from, in addition to what is known of external scientific competencies in various scientific institutions. Therefore, scientific research cannot be adopted and considered as a criterion for the quality, improvement and brilliance of the university without the emergence of a group of scientific projects, research and innovations to the labor market to convert into participatory investment projects between our university and the professional institutions, then we can declare the distinction, development and excellence of scientific research quality which consistent with the university's research centers outputs. Therefore. We are obliged to assume the responsibility entrusted to us with the participation of the faithful to reach these lofty goals. I would like to seize this opportunity being in the chairmanship of the University of Technology by looking forward to achieving what we aspire to promote and granting scientific high standard production in order to create a level of satisfaction , enhancing the spirit of belonging by investing all energies to build our academic institution and glorify its educational ,intellectual and social role.

PART 2: CONFERENCE ADVISOR

Prof. Dr. Alaa Abdulhassan Atiya

Vice-President for scientific and postgraduate affairs, University of Technology – Iraq

University of Technology is a dynamic and innovative university in Iraq. One of Iraqi's leading universities of technology, UoT has a distinct model of learning, strong research performance and a leading reputation for engagement with industry and the professions.UoT has a culturally diverse campus life and vibrant international exchange study and research programs that prepare graduates for the workplaces of today and the future.Our campus is in the heart of Baghdad located at Alsina'a Street – Alwihda district. Over the last five years, our University established many new building to meet the needs of our lovely students.Our Strategic Plan outlines our vision to be a world-leading university of technology and provides a strong statement about UoT's aspirations for our world.UoT is part of the Iraqi industrial Network that committed to work with industry and government to deliver practical and professional courses.With a total enrolment of over 10,000 students, UoT is one of the largest Engineering universities in Iraq.UoT offers undergraduate and postgraduate courses across traditional and emerging disciplines such as architecture, Mechanical Engineering, Electrical engineering, Civil Engineering, Electromechanical Engineering, Laser And optoelectronic Eng. , Production Engineering and Metallurgy, Control and System Eng., Communications Engineering, Computer Sciences, Applied Sciences, Computer Engineering, Chemical Engineering, Materials Engineering, petroleum technology and Biomedical Engineering. UoT offers a series of practice-oriented learning, many of our students undertake professional practice during their degree, as part of their degree program, and students also have the opportunity to participate in our exchange agreements.Also, our research centers span a range of disciplines, including physical, biological and engineering sciences, and contemporary fields such as nanotechnology and sustainability. Our researchers provide practical and relevant solutions to issues of national and international importance and equip graduates with the latest discipline specific skills and practices.We also maintain strong relationships with the local community, industry, business and the professions through a wide range of partnerships, projects and events.

PART 3: CONFERENCE CHAIRMAN

Dr. Omar Sabbar Dahham
Faculty of Engineering Technology, Universiti Malaysia Perlis – Malaysia

On behalf of the organizing committee, we are pleased to announce that the *2nd International Conference on Materials Engineering and Science* (I*Con*MEAS 2019) will be held from *September 25 to 26, 2019* at *University of Technology, Baghdad – Iraq*. I*Con*MEAS 2019 aims to provide an outstanding international academic forum for researchers to present the latest research findings and describe emerging technologies, and advancement in Materials Engineering and Science topics under the theme(*Insight on the Current Research in Materials Engineering and Science*).

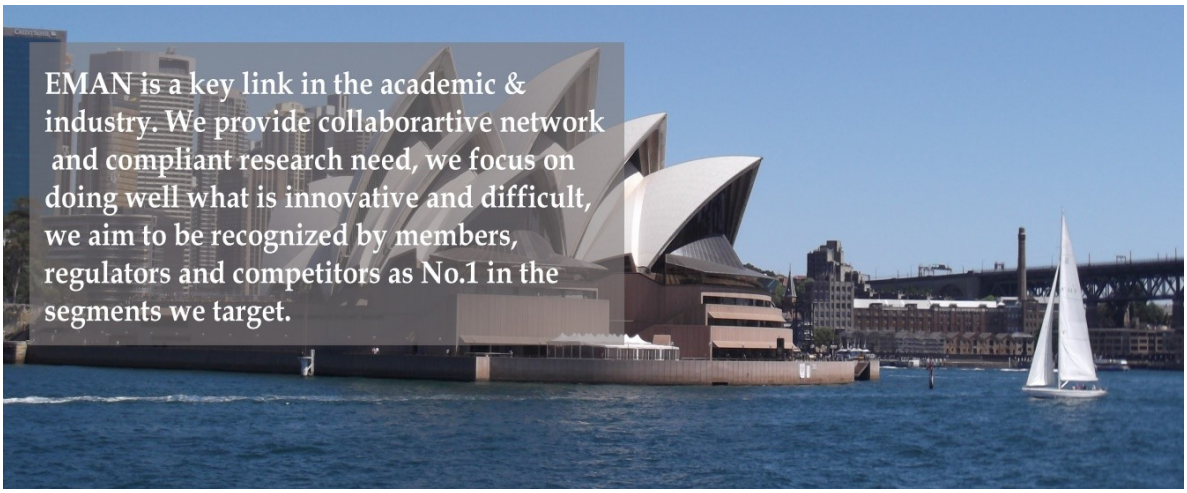
The conference aims to bring together leading academic scientists, researchers and students to exchange and share their knowledge and experiences in many aspects. It also provides the premier interdisciplinary forum for scientists, engineers, and postgraduate students to present their latest research results, proposals, and applications in all areas of Materials Engineering and Sciences.

The conference's goal is to provide a colorful international platform and to encourage face-to-face discussions, connections and exchange ideas between the scholars and scientists.

Hope to meet you at this international event

PART 4: ORGANIZERS

Eman Research– Australia



EMAN Research is a Not-For-Profit organization dedicated to helping researchers, pharmaceutical companies and students to ease their research success. Making drug discovery affordable and making the most of your research success.Eman Research (ER) aims are broadly span all aspects of angiogenesis-related drug discovery. ER's mission is to promote the development of angiogenesis-targeted compounds derived from plant extract. These may be crude, standardized or highly purified extracts.

Eman Research intends to promote a sustainable ecosystem in the pharmaceutical industry where many segments of the communities (such as pharma company or different wings of a same company) will benefit from the farming communities, industrial players and end users.

To protect and safeguard our environment, Eman Research will also promote the use of high tech agriculture such as the hydroponics system to ensure that our industrial needs have a minimal effect on our natural resources. EMAN Research will also promote the use of environmentally friendly energy sources such as solar, wind and biofuel. In January 2017 Eman Research has opened its activities in Australia.

University of Technology, Baghdad - Iraq

The university started with steady scientific achievements. It was established in 1960 with the idea of establishing an Institute of Industrial Teachers, outlined by the Ministry of Education in cooperation with UNESCO, the founding of the Institute was declared on 22 January 1960, The course of studies was limited to five years after acquiring the high school graduate Certificate, in the subject of Engineering Applications, the first batch was accepted with 45 male students, all of whom were graduates of Industrial secondary Schools. Since founding, the objectives of the Institute were identified by the need for Engineering Technologists, to work in the industrial sector, with emphasis on Engineering projects and Applications research labs, it was also charged with the task of preparing teachers to train professionals in the Industrial and Professional trades, aiming to solve the problems of availability of trainers and workers in those trades, and enabling specialists to manage departments and laboratories. The introduction of specialized learning sessions at the institute, was directed through recommendations and instructions of the Presiding Council of the Institute, and approved by the Ministry of Education.

The name of the institute was changed, a few months after its inception, to the Higher Institute of Industrial Engineering, then subsequently renamed after an order by the Ministry of Higher Education, due to its increased importance and to reflect its advancement, and in agreement with UNESCO in 1967, to The Higher College of Industrial Engineering and subsequently amended to the college of Engineering Technology, while simultaneously annexed to the University of Baghdad, Final disengagement of the Faculty from the University of Baghdad, was issued by The decision to establish the University of Technology on 1 April 1975, by a Presidential Decree. The University has many modern buildings. It has multiple coffee centers/cafeterias and two very large Internet centers. There are also a large gym center, two football (soccer) fields, a mosque, and a 13 different factories/shops for more practical experience for the students. The University also has a large central library. It is located on Al Sina'a Street in Baghdad's east side.

Universiti Malaysia Perlis(UniMAP) - Malaysia

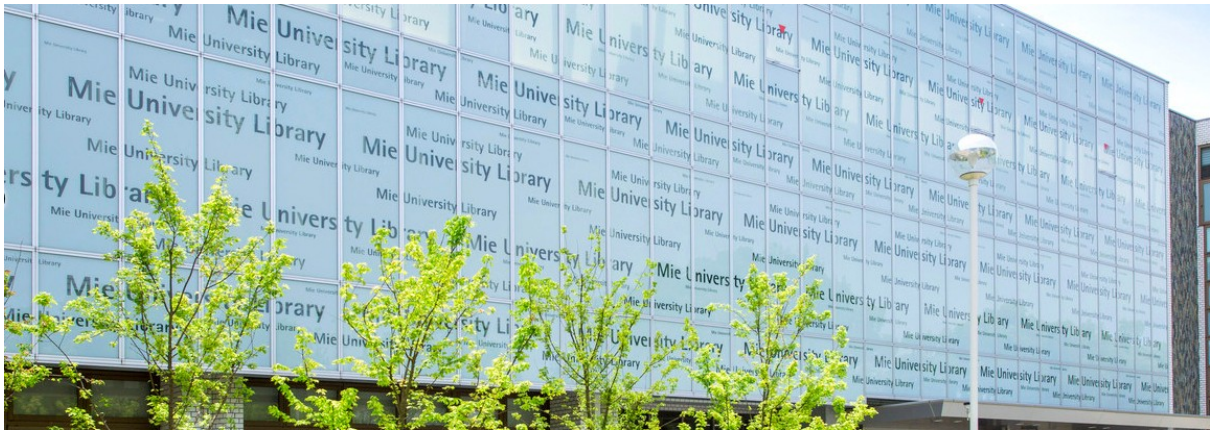
Universiti Malaysia Perlis (UniMAP)is Malaysia's 17th public institution of higher learning. It was approved by the Malaysian Cabinet on May 2001. Originally known as Kolej Universiti Kejuruteraa Utara Malaysia (KUKUM), or Northern Malaysia University College of Engineering, it was renamed as Universiti Malaysia Perlis (UniMAP) in February 2007. The first intake consisted of 116 engineering students who started classes on June 2002. Currently, UniMAP has approximately 13,488 students and a workforce of more than 2,193 academic and non-academic staff members. It offers 25 undergraduate programmes that lead to Bachelor in Engineering, 13 undergraduate programmes that leads to an Engineering Technology degree and two undergraduate programmes that lead to a Bachelor in Business. We also offers six Diploma in Engineering programmes and 39 postgraduate programmes that lead to Masters and PhD degrees.UniMAP graduates are nurtured to become competent practitioners in their area of specialization and to have the confidence to explore entrepreneurial possibilities upon graduation. They are expected to not only exhibit excellence in the knowledge and skills that are directly related to their specialized fields of study, but also to demonstrate outstanding proficiency in both communication and ICT skills, as well as possess unsurpassed traits of professionalism and patriotism.

Most of the engineering programmes at UniMAP have an electronic-based focus. However, both basic and applied studies on other fields of engineering and technology that support the advancement of engineering are also actively pursued here. In addition, International Business, Engineering Entrepreneurship and an MBA in Engineering Management are also on offer. The International Business programme is designed to produce global-business leaders who could function and compete effectively in the globalized market place. The Engineering Entrepreneursip programme aims to equip today's generation of 'technopreneurs' with an excellent entrepreneurial knowledge on managing industrial and technology-based businesses, whilst the MBA in Engineering Management is designed to produce competent managers for the engineering and technology sectors.

University of Science Malaysia (USM) - Malaysia

Universiti Sains Malaysia (acronym: USM) has won the most Entrepreneurial University 2018, in Malaysia and the only Accelerated Programs for Excellence (APEX) government funded Autonomous university in Malaysia. Founded on 1 June 1969 as a statutory body with its own constitution, it is among the oldest institute of higher learning (IHL) in Northern Malaysia. It has three campuses, a main campus on the island of Penang, a health campus in Kelantan, and an engineering campus in Nibong Tebal. There is overseas collaboration with KLE University, India offering the Doctor of Medicine (USM) undergraduate degree. USM plans to open a Global Campus (Kuala Lumpur Campus) located at Kuala Lumpur Education City (KLCE). With around 28,300 postgraduate and undergraduate students in 2009,[10] USM is one of the biggest universities in terms of enrolment in Malaysia. The number of lecturers is about 1,479, which leads to a student-lecturer ratio of around 19:1.

Mie University - Japan



Mie University (三重大学; Mie Daigaku, abbreviated to 三重大 Miedai) is a national university in Tsu, Mie, Japan. As with other national universities, Mie University has been a national university corporation since April 2004, when state-funded universities were partially privatised.[3] In 2006, it was ranked 250th in the Times Higher Education Supplement list of the world's best universities.[4]Mie University was founded on 31 May 1949 with two faculties: Liberal Arts and Agriculture. These gave way to the establishment's present composition of six faculties: Humanities, Medicine, Education, Bioresources, Engineering and Common Education - the latter dealing with cross-faculty courses such as English language teaching. Its Center for International Exchange promotes international links and issues involving the global community. The institution is Mie prefecture's only national university,[5] located in the city of Tsu in the Kansai region, within easy reach of Kyoto, Osaka and Nagoya. The campus is situated in the north-east of the city, close to the coast of Ise Bay. Though some students make use of nearby accommodation, larger numbers commute from the larger cities, as well as nearby towns such as Ise, Matsusaka and Toba.

PART 5: CONFERENCE COMMITTEE

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PART 6: KEYNOTE SPEAKERS

Prof. Dr. Uda Bin Hashim
Deputy Vice-Chancellor – Research & Innovation, UniMAP – Malaysia

Prof. Dr. Ali Hussein Ataiwi
Materials Engineering Department, University of Technology, Baghdad – Iraq

Assist. Prof. Dr. Harith Al-Azri

Deputy Dean, Rustaq College of Education – Sultanate of Oman

PART 7: LIST OF ABSTRACT

Paper ID: 003

Co-Occurrence of *Fusarium* Head Blight and Crown Rot on Several Wheat Cultivars in the South of Iraq, Basra Province.

Mohammed Hussein Minati [1,] Mohanned Khalaf Mohammed-Ameen [2]

[1]. *Plant Pathology Lab., Dept. Biology, College of Science, Basra University, Basra, Iraq.*
[2.] *Dept. Biology, College of Science, Basra University, Basra, Iraq.*

Abstract. This study was conducted to evaluate the distribution of an 88 *Fusarium* isolates causing *Fusarium* head blight (FHB) and *Fusarium* crown rot (FCR) on wheat in 14 fields within 7 districts in the north of Basra, Iraq. The results revealed that the distribution of FHB and FCR symptom occurrence was differed according to the selected sites, infected plant parts and tested seven cultivars. The highest isolation occurrence was recorded at Nashwa (N) field with 92% and the lowest was noticed at Al-Modienh/Salih River (MSR) field with 25%. The highest *Fusarium* isolates were occurred on the basal stem with 35.27%, and the lowest was isolated from seeds and soil samples both of which with 1.13%. The 88 *Fusarium* isolates were distributed on nine species (14 *F. chlamydosporum*, 19 *F. graminearum*, 7 *F. equiseti*, 4 *F. avenaceum*, 19 *F. culmorum*, 9 *F. solani*, 13 *F. pseudograminearum,* 2 *F. cerealis* and 1 *F. nygamai*. Abu Ghraib 3 (AG 3) cultivar shown significantly the highest isolation occurrence of *Fusarium* isolates compared to other examined cultivars with 32.95 %; while, the lowest was Rasheed (R.) cultivar at 3.4 %. *F. graminearum, F. culmorum, F. pseudograminearum* and *F. chlamydosporum* were the highest identified species in this study as causal pathogens for both diseases (FHB and FCR).

Paper ID: 004

Experimental Study of RC Deep Beams Strengthened by NSM Steel Bars

Hayder H. Kamonn, Abdullah Sikar Hassan Al-Issawi

[1.] *University of Kufa – Faculty of Engineering, Najaf,Iraq*
[2.] *University of Kufa – Faculty of Engineering, Najaf,Iraq*

Abstract. In this work, an experimental investigation on the behavior of reinforced concrete deep beams strengthened by near surface mounted steel bars is presented. Thirteen beams were cast and strengthened by steel bars with different strengthening schemes. The specimens were categorized into three groups according to the shear span over depth (a/d) ratio. Each group contained one unstrengthened beam as a control and another strengthened beams by using different strengthening schemes of NSM steel bars. Some parameters that may affect the performance of strengthened deep beams were studied such as bars spacings, bars sizes, and their inclinations. All beams were tested under two points loading adopting various shear span over effective depth ratios. The test results showed considerable enhancement in the ultimate capacity of strengthened beams that is by about (7.35 % to 20.6 %). Besides that, ductility and diagonal cracks width were improved when adopting more intensive strengthening schemes.

Paper ID: 005

Foundation Relative Stiffness Effects in Sand under Static Loading

Zuhair Kadhim Jahanger[1,2], S.J. Antony[3] and Akash Hirani[4]

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[2]*Lecturer, PhD, Department of Water Resources Engineering, College of Engineering, University of Baghdad, Al-Jadriya Campus, Baghdad, Iraq, ORCID number: 0000-0003-2869-9178.*
[3]*Associate Professor, PhD, School of Chemical and Process Engineering, University of Leeds, LS2 9JT, Leeds, UK, ORCID number: 0000-0003-1761-6306.*
[3]*Graduated student, MSc, School of Chemical and Process Engineering, University of Leeds, LS2 9JT, Leeds, UK.*

Abstract. . In the geotechnical engineering applications, precise understandings on the effects of a relative stiffness of foundation on its bearing capacity and settlement are yet to be established. The modern foundation construction uses the new available construction materials that totally change the relative stiffness of the footing structures–soil interactions such as waste material and landfill area of more residential purposes. Conventional bearing capacity equations were dealt with common rigid footing and thus cannot be used for reduced foundation rigidity. Therefore, this study investigates the effects of relative stiffness of foundation on its pressure-settlement behaviour and the soil deformation field using compression test of a smooth strip footings on surface of sand of different packing densities. Nine experimental tests using three footing materials (plastic (P), rubber (R) and aluminium (A)) that differ in relative stiffness with three soil densities were used. This study has separated the effects of relative stiffness of the foundation systems on bearing capacity and settlement by defining the failure mechanism using digital particle image velocimetry (DPIV). The bearing capacity decreases as the foundation system stiffness increases. This decrease, however, is also associated with a smaller ultimate settlement. It is worth mentioning that a clear trend can be observed in sizes of the slip failure envelopes when comparing flexible and rigid foundation systems. The soil particles in the failure zone under the footing have the highest vertical displacement for the increase in the rigidity of the footing system. A change in the relative stiffness of the foundation system affects the displacement and failure zone of the sand stratum and precise analyses have been taken into the pressure-settlement behaviour, failure mechanisms and velocity fields.

Paper ID: 006

Ab initio Calculations of Ring Current Density of Some Benzenoids

Manal O. Hamzah

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Abstract. A change of the ring current density resulting from the effect of an external magnetic field of a set of cyclic hydrocarbon molecules was calculated using the full *ab initio* method. The results are beneficial to determine the quantity of aromatic character of cyclic molecule. These values are drawn as vectors to show the change of dia and paramagnetic of electrons movement of molecule. The direction of arrows on the perimeter of the ring showed that all molecules have a diatropic ring current (anticlockwise)/aromatic. And the size of the arrows shows a large contribution to currents on the perimeter. The maximum contribution to current density was represented as j_{max}. The results revealed that for molecules with the same number of rings, the maximum current density j_{max} of the peri-condensed molecule such as chrysene KF3 (j_{max}= 0.12269) was bigger than it for catacondensed molecule such as triphenylene KF2 (j_{max}= 0.10682) and KF4 (j_{max}= 0.10831). Also, for the given molecules of a study, it is found that ovalene KF18 has the biggest j_{max} (0.15321). Accordingly, it has the minimum aromaticity/ stability. And a dibenzo [fg, op] tetracene KF13 has the smallest j_{max} (0.10584) and the highest aromaticity/ stability.

Paper ID: 007

Material Response Characterization of Three Poly Jet Printed Materials Used in a High Fidelity Human Infant Skull

Ghaidaa A. Khalid[1)], H. Bakhtiarydavijani[3)], W.R. Whittington[3)], R. Prabhu[3)], M.D. Jones[2)]

[1]*(College of Electrical Engineering Techniques, Middle Technical University, Baghdad, Iraq).*
[2]*(Institute of Medical Engineering and Medical Physics, Cardiff School of Engineering, Cardiff University, The Parade, Cardiff, CF24 3AA, Wales, UK).*
[3]*(Department of Agricultural and Biological Engineering and the Center for Advanced Vehicular Systems, Mississippi State University, Mississippi, USA).*

Abstract. This present study seeks to improve the infant head model biofidelity by providing a range of 3D printable candidate materials tested at different temperatures and strain rates so as totailor materials properties to match the specific age-dependent infant skull being modeled. Mechanical proprties of the three polypropylene polymers named VeroWhitePlus (RGD835 VW), TangoBlackPlus (FLX980), and RigidLightGrey25 (RGD8510-DM), were applied using a PolyJet 3D printer to replicating the comparativepaediatric skull (cranial bone, fontanelles, sutures) mechanical properties. Quasi-static tensile tests were carried out for VeroWhitePlus, RigidLightGrey25 and TangoBlackPlus PolyJet polymers at two different speeds, and 3 temperatures. Strain rate and temperature dependence on elastic modulus and flow stress is evident. Mechanical properties of the PolyJet polymers indicate appropriate response for biocompatibility in modeling infant skull. Temperature dependence of the mechanical properties of the PolyJet polymers indicate a uniquemethod to fine tune the mechanical response for specific age-dependent infant skull modeling.

Paper ID: 008

Optical Properties of Incorporating of Zno Nano-Particles on the Dopantpoly (O-Toluidine)

Rawnaq A. Talib[a,], Dalal K. Thbayh[a], Kareema M. Ziadan[b]

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[b] *University of Basra, College Science, Department of Physics, Basra, Iraq*

Abstract. This work submit a study of the optical characteristic and EDX of nano ZnO/poly (o-toluidine) (POT) doping with organic acids dodecylbenzene sulfonate acid (DBSA) composites were synthesized by in-situ chemical oxidative polymerization method of (o-toluidine) monomer in existence of different ZnO nanoparticles concentration (weight ratio OT/ZnO:1/0.05, 1/0.1, 1/0.15), the products were washed by the centrifugation method, in order to avoid higher loss of ZnO. Those POT-DBSA/ZnO composite films were intended by spin coating procedure. The optical properties of the prepared films were examined by Fourier transform in-frared (FT-IR), UV-Visible. The structure properties of composites films were tested by energy- dispersive X-ray spectroscopy (EDX). The results of FTIR indicate that ZnO were successfully embedded in the POT via chemical interactions between ZnO and OT monomer. The results of UV-Visible showed a sharp increase in the band gap from (2.55to2.68) eV with increasing the percentage ratio of ZnO nanoparticles in POT-DBSA matrix. The EDX spectrum showed the presence of element Zn in POT-DBSA/ZnO composites, it is absent in POT-DBSA, which was consistent with the results FTIR.

Paper ID: 009

Estimation of Water Surplus and Natural Groundwater Recharge in Iraq

Hussein Ilaibi Zamil Al-Sudani[1]

[1] *Petroleum Technology Department, University of Technology, Baghdad, Iraq*

Abstract. Climate and hydrological conditions in any hydrological basin are multi-combined reflection of natural factors of morphology and soil nature, as well as the changing in climate factors that affect directly on hydrological cycle. The water balance equation for any natural area or water body indicates the relative values of inflow, outflow and change in water storage for the area or water body. Estimation of water surplus and natural groundwater recharge in Iraq depending on water balance equation and meteorological data was the aim of this research. Corrected potential evapotranspiration (PEc) were compared with annual and monthly rainfall in (32) meteorological stations to obtain actual evapotranspiration (AE) using water balance equation. Water surplus was divided into runoff and natural groundwater recharge where runoff coefficient method was used to estimate runoff. The obtained mathematical relationship between rainfall with both water surplus and actual evapotranspiration can be used to estimate these two parameters directly from rainfall. The results indicate that water surplus increased towards north-east direction of Iraq, while the minimum values of runoff and groundwater recharge located in western desert of Iraq. The climate conditions of desert was the major influence on reducing rainfall and rising temperature resulting decreasing water surplus, runoff and groundwater recharge.

Paper ID: 011

Optimizing of macro porous silicon morphology for creation of SnO_2/CuO nanoparticles

Ali A. Yousif[1], Alwan M. Alwan[2], Husam R. Abed[1]

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Abstract. A set of macro porous silicon (ma-PSi) substrates with various surface morphologies fabricated at various etching times was inspected as a substrate for creation of SnO_2/CuO nanoparticles. Spray pyrolysis process of 0.1 M $SnCl_4.5H_2O$ and 0.1 M $CuCl_2$ with mixing concentration (70%SnO_2:30%CuO) was used to create SnO_2/CuO nanoparticles. The n-type PSi was fabricated in electrochemical etching method assisted with laser photonic source at various four different morphologies of ma-PSi pore-like structure, and different roughness values 17.1, 16.1, 46.9, and 32 nm were fabricated with changing the etching time 7, 14, 21, and 28 min, correspondingly. The topographical and cross-sectional morphological characteristics of substrates before and after incorporation of SnO_2/CuO nanoparticles were inspected through examining of scanning electron microscopy (SEM), atomic force microscopy (AFM), and X-ray diffraction (XRD) patterns. The results displayed that the SnO_2/CuO nanoparticles sizes be governed by the surface topography and roughness of ma-PSi. The SnO_2/CuO nanoparticles created by Spray pyrolysisprocess are governed by the porosity and the shape of pores in pore-like structure. For 35% low porosity ma-Psi of non-completely cylindrical shape, the sizes of SnO_2/CuO nanoparticle were in the range from 58.3 to 63.1 nm for a low surface roughness. For 54%, 67% and 78% high porosities of ma-Psi of complete form which owns the higher pore dimension and surface roughness, SnO_2/CuO nanoparticle sizes fluctuate from 65 to 70.6 nm, 23.7 to 28.9 nm and 33 to 39 nm, respectively. The lowest SnO_2/CuO crystal size of about 11.5 nm and higher specific surface area were achieved from a porous surface ma-Psi of 67 % porosity. Photoluminescence showed multi peaks at visible region with the red shift as the etching time increase.

Paper ID: 012

Spectrophotometric Determination of Chlorpromazine Hydrochloride using 4-amino benzoic acid by oxidative coupling reaction

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Abstract. Simple, rapid spectrophotometric method has been established for the determination of chlorpromazine hydrochloride (CPZH) in its pure form and in a tablet formulations. The suggested method is based on the oxidative coupling reaction with4-amino benzoic acid using KIO3 in acidic solution to produce a violet colored product with maximum absorption at λ=560 nm. The analytical data obtained throughout this as follows: The Beer′s law is obeyed over the concentration range of (10–70) µg ml-1, but the detection limit and quantification limit are 0.194 besides 0.588 µg ml-1 respectively. The correlation coefficient (r) for the calibration graph was found to be 0.9990, molar absorptivity of 6.00 X 103 L.mol -1.cm-1, and Sandell′s sensitivity index of 0.0592 µg.cm-2. Direct and standard addition procedures were applied to both standards and specimens of pharmaceutical and the results indicate that the suggested method was successfully applied for the determination of CPZH.

Paper ID: 014

Antimicrobial and Antioxidant Activity of Iraqi Cupressuss empervirensCones

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Abstract. Conifer is one of the most important medicinal plants distributed around the world. These trees are widely distributed in the north of Iraq. Among these conifers which presented in Iraq is *Cupressussempervirens* (cypress). This plant was reported to contain many active constituents.Cones of cypress were divided into two parts, one was extracted with ethanol while the other extracted with hexane and then the mark was re-extracted with aceton/water.Phytochemical investigation was performed using chemical reactions.Antimicrobial activity of cone extracts is studied using agar well diffusion method. DPPH assay is used for detecting the antioxidant activity.The phytochemical analysis of ethanolic extract of cone of *C.sempervirens* revealed the presence of tannin, glycoside, alkaloid, terpene and flvonoid, cone extractsshowed antimicrobial and antioxidant activity as compared with ciprofloxacin and ascorbic acid respectively,ethanolic extract showed the best result in both cases.Different type of cone extracts of *C. sempervirens* showed antimicrobial and antioxidant activity, both are important in the treatment of many disease so further study are needed to investigate phytochemical component of other parts of the plant and to study the biological activity of these compounds.

Paper ID: 015

Synthesis, Thermal analysis, Spectroscopy and Magnetic properties of some transition matls complexes derived from new azo compound

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Abstract. A new Azo compound (C17 H13ClN2O4S) (E)-4-chloro-5-((2-hydroxynaphthalen-1-yl) diazenyl)-2-methylbenzenesulfonic acid (L) was synthesized. The prepared compound was used as a ligand to prepare monomeric transition complexes [M(L)(H2O)2Cl2 via reaction of ligand (L) with hydrate metal salts M(II) where [M= Manganese (II) , Cobalt(II) , Nickel(II) , Copper (II)] in a (1:1) ratio . the data were obtained from 13C-NMR , UV-VIS and FT-IR studies , elemental microanalysis , TGA , molar conductance , metal content , magnetic moment measurements and thermal analysis confirmed the formation of ligand and their complexes and all the prepared complexes have octahedral geometrical structures.

Paper ID: 016

Removal Toxic Materials from Refinery Wastewaterby using Low Cost Materials as Adsorbent

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Abstract. Adsorption of heavy metals (Cadmium and Nickel) and phenolic compounds (phenol) from refinery wastewater in Beiji using rice husk and tea waste was compared to the efficiency of the removal of activated carbon (GAC) were studied with initial concentration of 10 mg/l for heavy metals and 5.6 mg/l for phenol. Langmuir and Freundlich isotherms as models for the adsorption. The results show that the best fit model to explain this process is the Langmuir isotherm. And that the efficiency of the adsorption process is affected by: flow rate, pH, bed high and type of adsorbent. Highest removal efficiency for rice husk(82.37 ,96.8 ,99.9 %) to phenol ,Nickel and cadmium were respectively ,highest removal efficiency for tea waste(41.25 ,97.8 ,98.7%) to phenol ,Nickel and cadmium were respectively were obtained pH 7.6 .

Paper ID: 017

Fire Resistance of Selected Construction Materials

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Abstract. In this study, the effect of firing temperature on clay bricks and cubic concrete specimens was studied at a temperature of 600 °C to investigate how these common used construction materials behave during the fire disasters. Extensive tests programs are conducted on bricks specimens that were collected from many different sites in Wait governorate as well as many groups of concrete cubic specimens at 7 and 28 day. The changing of the compressive strength of concrete and clay bricks after firing at high temperature was investigated experimentally. As well as, study the effect of firing temperature on clay bricks using efflorescence and water absorption tests on bricks. The study ascertained that the firing temperature has a significant effect on clay bricks and concrete, where they are less efficient in the load resistance capacity under compression. Also, increase in the efflorescence of bricks and decreases in average of water absorption by bricks are noticed.

Paper ID: 020

A Comparative Study of Bond Currents of Some Benzenoids using Hückel-london, Spanish and Polish Models

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Abstract The bond currents of a set of benzenoids of size (1-7) hexagon have been investigated using three models; Hückel-London, Spanish and Polish. The results revealed that the large polybenzenoids have high diatropic contribution to current density (anticlockwise circulation). And the maximum contributions to current density are related to the pericondensed molecules. Subsequently, these molecules have less aromaticity/ less stability. A comparison showed that the results of three models are agreed well. However, the significant result is that using a graph theoretical-molecular orbital model (Hückel-London), the current density of single bonds with zero bond order was slightly higher than zero. But using the conjugated circuit CC models; Spanish and Polish, the current density of those bonds was zero.

Paper ID: 021

Temperature Effect on Electronics Properties for Alloys $Ga_xIn_{1-x}As$ and Inp and Mole Fraction of Gallium for Alloy $Ga_xIn_{1-x}As$

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Abstract. Thermal treatment and mole fraction of Gallium plays a major role in the electronic properties of alloys. That may enhance some of their properties and so increase their efficiency in the technical applications. In this work, the thermal effects on the electronic properties for semiconductor ternary alloys GaxIn1-xAs and InP have been studied. For the mentioned alloys, the results show a reduction in the energy gap as the temperature increased. In addition, after 350Ko, concentrations of the carrier in alloy Ga0.35In0.65As rapidly increased as temperature increased. While at 420Ko the carrier concentration changed abruptly in the InP alloy. It was also confirmed that the increase in temperature highly effects in the effective density of states and electrical conductivity for both alloys. The carrier concentrations and energy gap equations as a function to temperature (for the alloy GaxIn1-xAs at different concentrations of gallium (x)) were investigated.

Paper ID: 022

Design and Investigation an Optical Modulator Based on Olive Oil as a Liquid Crystal

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Abstract. In this work, we report the main conclusions to provide a study of Olive Oil as Liquid Crystals used in instrumentation of the optical regime geared towards a wide range of applications as an optical modulator device. The optical modulator has been implemented in this project consist of two parallel plates covered of housing glass window filled by oil olive. The results have been showed a variation of the output intensity when applied high tension voltage at room temperature. Also, changing of transmittance ratio with different temperature effect. This result indicates that can be modulate the light by olive oil.

Paper ID: 023

Soils Field Compaction Ratio Estimation using Field Pocket Penetrometer Tool Readings

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Abstract.The main purpose of soils compaction ratio computing is to check the compaction ratio of soil fill with respect to maximum soil dry unit weight. This study produces compacting soil ratio calculation based on reading of the soil pocket penetrometer. The pocket value within certain procedure contains testing the same point location selected to test soil layer that adopted in standard normal compaction ratio determination. The four to five points pocket penetrometer tool tested at the compacted topsoil layer surface. The results of (130) points indicated that there is a good agreement between compaction ratio and pocket penetrometer readings with the linear interpolating relationship. The study also predicts linear relationships design equations for predicting compaction ratio and modulus of sub-grade reaction with acceptable regression (R2) values but with certain limitations. Keywords: Soil compaction ratio, pocket penetrometer tool, coefficient of subgrade reaction, pocket penetrometer compaction design equation.

Paper ID: 024

New Application of Pervaporation to Enhance the Conversion of Consecutive Reaction

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Abstract: This study investigates consecutive reaction assisted by pervaporation for the first time. It studies the saponification of diethyladipate DA with sodium hydroxide NaOH solution synchronous with separating ethanol from the reaction mixture through an aqueous – organic membrane. The effect of time on some variables such as: permeated ethanol concentration EtOH wt%, separation factor (α), concentration of NaOH solution C_B in the reaction medium and the conversion of DA to monoethyladipate (the intermediate product) was studied. It was shown that EtOH wt% and the conversion increased with increasing time unlike C_B but (α) showed the existence of maximum value during the time of experiment. The process of reaction assisted by pervaporation is promising for industrial process because it significantly increases conversion and reduces reaction time.

Paper ID: 025

Experimental Investigation and Mathematical Modeling of Corrosion Growth Rate on Carbon Steel under the Influence of Soil Moisture Content and Time

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Abstract. Soil deterioration is a serious threat to the reliability of buried assemblies such as underground storage tanks, oil and gas transmission pipelines. The effect of soil moisture content and time on the corrosion performance of steel in soils of dissimilar location of Basra (West Qurna , Foe and Majnoon) was investigated using weight loss measurement. The result showed that the corrosion is correlated with the high moisture content of soil and with increase time . Also, at the critical moisture content the corrosively of the considered soils is given in the request: Majnoon > West Qurna > Foe. Statistical analysis was carried out to study the relationship between soil engineering properties and corrosion rate. The site testing results indicate times as the most governance effect on corrosion rate based on the correlation coefficient. Further investigation using the analysis of variances (ANOVA) and multiple regression analysis showed good agreement between experimental and prediction corrosion rate.

Paper ID: 027

The Influence of Cold Atmospheric Pressure Plasma on TSH and Thyroid Hormones in Male Rats

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Abstract Cold atmospheric pressure plasma (CAP) is used as a new tool for various biological and medical applications.As plasma directly contact with organism, so the effect of non-thermal atmospheric pressure plasma that generated by Floating Electrode Dielectric Barrier Discharge (FE-DBD) would influence levels of triiodothronine (T_3), thyroxin (T_4) and thyroid stimulating hormone (TSH) hormones in healthy adult male rats (Albino) / bulb c), which have been divided into groups according to time exposure of plasma (15, 30, 60, and 90 second) and control group (without plasma exposure), with different time intervals after exposure (1, 2, 3, 7, 14, 28 days).The concentration of T_3, T_4 and TSH hormones are measured by using Enzyme Linked Immunosorbent Assay (ELISA).Our observations show that T_3, T_4 and TSH are affected by plasma from the first day of exposure. More specifically, group of (30 sec) shows a significant increase in T_3, T_4 accompanied with a significant decrease in TSH and conserving in body weight (relative body weight retention) compared to the control. Consistently, there was a significant increase in T_4, with a significant decrease in TSH and body weight in group of (60 sec), however, there was no significant change in the level of T_3. Moreover, group (90 sec) shows a significant increase in T4 level starts from day one of exposure and reached to control value in the fourth week, with significant decrease in TSH and body weight. Furthermore, group (15 sec) shows slight different in T_3 and T_4 levels compared to control, with a significant decrease in TSH that concomitant with normal increase of body weight. This result indicates that the plasma effected is different depending on the time exposure, and the time exposure (30, 60, and 90 sec) are effective with maintaining body weight, there is little increase compared to control group.

Paper ID: 028

Optical Investigations of Poly (vinyl alcohol) doping with Cobalt nitrate Thin Films

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Abstract. In current study, thin films of Poly (vinyl alcohol) doped with cobalt nitrate at volumetric ratio of (0.1-0.3) % where prepared using casting method at room temperature and then some optical properties using spectrometer (190-1100nm) were recorded. Effect of cobalt nitrate dopant on the optical parameters was studied involving refractive index, extinction coefficient and determine the optical energy gap, whereon clarified that the indirect energy gap values were around (2.15-2.25eV) depending on the doping. Also, both real and imaginary parts of dielectric constant, the width of tails, Finesse coefficient, critical angle and Brewster angle were computed.

Paper ID: 029

New Generation Energy Resources and Effect on Total Energy Consumption

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Abstract. Wind and solar energy resources are among the alternative energy sources that are environmentally friendly and reduce the production of greenhouse gases. Turkey ranks 7th in Europe and ranks 12th in the world by wind energy potential. In the article presented here, Kurna (Pendik, Istanbul) was chosen as the pilot study area for estimating the energy potential of solar energy and wind energy combined systems. Optimal material selection for these subsystems is done with the help of data mining, based on wind-solar energy potential prediction results. According to the ANN results based on the Levenberg-Marquardt algorithm, the most successful model estimation results are obtained for the fall season (September 2016), according to the statistical and ANN analyses. The coefficient of linear correlation between the observational data and the model results (test data); R = 0.86, 'α' confidence level was lower than %0.001. Wavelet analysis shows the potential of small, medium and large scale (time environment, minute, hour, day, month, and season) factors on wind and solar energy potential and conversion systems. The results of this research may be useful in selecting short-to-long-term estimates of renewable energy potential, optimum materials for conversion and storage systems.

Paper ID: 031

A New Method to Improve the Performance of Solar Chimneys

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Abstract. The system of the solar chimney is one of the most applications used to harness solar energy to generate electricity. The solar chimney system is characterized by low efficiency, which requires exploring ways to enhance systems productivity. Also, System performance has been improved through developing the overall efficiency of these systems using a solar cell. The current study aims to integrate solar chimneys and solar cells in a hybrid system to achieve the desired goal of increasing the production of electric power. A practical model of the hybrid solar chimney system was built to study the thermal and electrical performance of the solar chimney. The solar cell was used as an absorbent black surface for the base of the solar chimney. The study showed that the thermal efficiency of the hybrid PV/solar chimney system was relatively high about (91%) because of the presence of glass cover, which does not allow the exit of sunlight falling on the solar collector, which leads to a higher temperature about 67 ^{o}C. Also, the obtained data showed that the total electrical efficiency of the system is about (10.5%). Moreover, the collector inclination angle has an essential effect on the performance of the system, and the 45 ° angle was the best angle of performance for the angle values taken (30 °, 35 °, and 45 °).

Paper ID: 032

Nano cellulose Synthesis and Study its Mechanical and Degredation Properties

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Abstract Nano fibrils cellulose was synthesis from raw cotton by chemical method. Composite of nano cellulose structure /Epoxy were manufactured by (0, 10 and 20) %wt contents. Mechanical properties of compounds were studied. When adding the cellulose nano, the tensile force and compressive strength were affected for the better, and the Yung coefficient was reduced to (0.12 MPa). The thermal decomposition potential was also demonstrated and the enhancement of temperature increase to (85-90)° C convert the nano cellulose structure to nano carbon with particle size (4.5 nm) calculate from sherrer equation.

Paper ID: 033

Production of Concrete Block using Recycled Aggregate

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Abstract. Block is an old building material used in construction and there are different types of block (hard and hollow). The main materials that used in this study are cement, sand, gravel, water, superplasticizer (Conplast SP423) as well as, the sawdust and/or PVC waste materials. Thus, the study includes two stages; the first stage deals with the production of concrete specimens with different percentages of sawdust and/or PVC waste materials as partial replacement of the total aggregate in the mix. The compressive strength and air-dry density were tested in this study.The second stage of this study includes the production of concrete block using these waste materials. The produced concrete block units have been tested in compressive strength, density and absorption. The results show that the use of 8 to 10% of PVC waste and combination of PVC waste and sawdust are selected for the production of concrete block units. The decrease in the weights of concrete block due to sawdust and/or PVC waste materials encourages the engineers or researchers to produce such concrete block by the use of these materials in the manufacture. The produced hollow block units produced from the uses of 4% PVC waste + 4% sawdust, and also 5% PVC waste + 5% sawdust show significant results for each of gross density and compressive strength. Thus, the recorded values for the mentioned replacements are 1580 kg/m^3, 7.8 MPa, 1450 kg/m^3 and 7.0 MPa, respectively.

Paper ID: 034

Ultra Micro Determination of Ascorbic Acid in Biological Samples by Coupling Reaction

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Abstract. Vitamin C (ascorbic acid, ascorbate, AA) is a water-soluble organic compound which can play a particular role in body function. The important goal of this article was to found of an analytical approach to assessment of Ascorbic acid compound by using organic reaction, depend on coupling reaction with diazotized solution of 4- amino antipyrine with buffer solution Na_2HPO4 (pH= 10.8) to produce a color compound yield with orange soluble azo dye with high absorptivity at a wavelength of 450 nm. A group of reactions has been done in order to reach a typical conditions for this method. For a range of concentration ($9.14x10^{-8}$ – $2.28x10^{-3}$ µg/mL) a calibration curve was taken and the value of molar absortivity was $1.6x10^{3}$ $L.mol^{-1}.cm^{-1}$, with a relative standard deviation more than 1.15% and a recovery 99.66%. By using the mole ratio method we conclude that the mole ratio for this reaction is 1:1 (Ascorbic acid: 4- amino antipyrine) and the stability factor reach to 1.8x106 $L.mol^{-1}$. The proposed method showed a group of merits such as very simple, not consume time, ability to verify a variety of examined samples, also screening and confirmatory analyses could be used for routine as well. The result that we obtained revealed that the method was successfully validated to the analysis of the Ascorbic acid in biological samples.

Paper ID: 037

On the Dirichlet Problem for the Nonlinear Diffusion Equation with Convection and Reaction

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Abstract. In this paper, we deal with the degenerate nonlinear parabolic equations for the diffusion, convection and reaction. It has applications in many areas of engineering and science such as filtration in a porous media. In some restrictions we prove the existence of weak solutions and boundary regularity for the Dirichlet problem of the parabolic equation in irregular domains where the convection and reaction have the same power in this model.

Paper ID: 038

Proton Single Differential Cross-Section, Electron Energy Loss and Elastic Mean Free Path in ZrO_2 and Al_2O_3

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Abstract. Many research studies the loss of ion energy in chemicals and materials, because this subject has a great interest for multiple applications in material science and atomic physics. Proton loses its energy when interacting with oxides such as Al2O3 and ZrO2. In the current work under the formalities of insulation, the calculations were performed using a combination of Durde energy loss functions with a generalized oscillator to describe the electrons in the outer and inner cascades sequentially.Provides a realistic description of the electronic properties of each goal of this method. Comparable cross sections are compared fairly well with a wide range of proton energies with experimental data available. The non-free average path parameter (IMFP) is calculated because the most important in surface-sensitive quantitative spectral analysis (IMFP) can be determined as the average distance between an electron and a given energy between successive non-elastic collisions. Another parameter describes the angular distribution of the extruded electron. This parameter is known as the differential cross-section, thus obtaining the energy distribution of the electrons produced by each proton from the corresponding cross-section .

Paper ID: 039

Reducing Water Cut Using**Polyacrylamide Polymers**

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Abstract: Most of the oil fields inject water as a secondary recovery to maintain the pressure at the reservoir when reservoir natural energy is consumed and pressure is declined during the initial production stage. The disadvantage of using water as injection fluid is that the injected water will tend to finger by the oil because of low viscosity of water compared to oil and moves through the shortest path to the production wells under high water-oil mobility ratio condition, so large amounts of oil are left behind. In order to avoid the high mobility condition of injected water, polymers have been used. It is simply a chemicals dissolved in the injected water and because of the polymer high molecular weight, small amount within several hundred ppm will give significant increase in viscosity of injected water. As a result, it leads to better mobility ratio, reduces fingering effect and increases sweep efficiency. The scope of the current work is to study the effect of polymer injection in porous media on water cut and oil recovery and compare the results with that of water flooding. This study has been done using artificial core with a permeability of 1.82 Darcy and porosity ranging from 32.7 % to 33.7%. Three types of polymers with different molecular weight have been used. Results from artificial core flood experiments show that polymers reduce water cut and improve oil recovery.

Paper ID: 040

Behavior of Self-Compacting Concrete Produced From Recycled Aggregate

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Abstract. The covers the studying for the fresh and hardened properties of self-compacting concrete (SCC), using two types of fine materials (silica fume and limestone powder as 10% each by weight of cement. Also, the uses of crushed bricks aggregate and recycled concrete aggregate with different percentage of replacement from the aggregate (coarse & fine) have been prepared in different concrete mixes. The effect of each type on the fresh and hardened properties of SCC has been studied. The fresh properties of SCC are measured by using Slump Flow, J-Ring tests and fresh density. While hardened properties which are compressive, splitting tensile & flexural strengths tests, as well as, dry density, and water absorption. The results show that adding recycled materials to the SCC reduces the workability and may variously affect the hardened properties of concrete according to the replacement percentage of aggregate. The fresh and hardened properties of SCC containing 25% crushed brick shows better enhancements than that of SCC containing the same percentage of recycled concrete aggregate. Also, the combination of 25% crushed bricks aggregate + 15% recycled concrete aggregate provides significant percentages uses of these ruined buildings to be recycled with the production for the construction of new buildings. Steel nails fibers have been used to enhance the ductility of SCC. The Percentages of 1% and 1.5% of such fibers were used. The flexural strength of self-compacting fibers reinforced concrete (SCFRC)has been increased by about 33% to 35% due to 1.5% of steel nail fibers for the mix 25 crushed brick+15% recycled aggregate concrete and mix contain 25 %crushed brick, respectively

Paper ID: 041

Geo-Database Production of Digital Land Use Map Using Remote Sensing and GIS Techniques

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Abstract. With the advent of new technologies, cartographic process, digital map generalization and procedures are being developed to help the production of a digital map. Also, the requirements of different map users for the integration of raster data, like satellite images, in Geographic Information Systems (GIS) have become widely used. The resolution and characteristics of satellite images are useful to visual interpretation and feature analysis. The digital map is a symbolic computer representation of the earth's surface linked to coordinate system, this system allows the users in controlling on the scale when printing maps, which are produced from spatial data sources represented by: scanning the topographic map and processing by many programs like AutoCAD, Google Earth and GPS data. Also, the satellite image can be processed by ERDAS imagine software. The numbering process for maps and aerial images comes within the data collection, input, and processing phase in GIS project. These numbering, and processing operations are not straightforward, but require the processing, adjustment or correction of maps and aerial coordinates. The implementation of a physical data model results in the creation of a database. Depending on its intended purposes, a database may be of different sizes and varying complexity. It may be created and managed manually or by computer, which is called DBMS. Functionally, a "DBMS" is a collection of software which support the process, defining, constructing and manipulating the database for various applications. All features are related to database contained their metadata and spatial data. The databases help greatly to accelerate accessing the data. Instead of waste the time and effort in searching, these data are collecting, storing and analyzing to use it for future studies. The databases facilitated the process of modifying the data and contributed significantly to the necessary updating process, in addition to facilitating the processes of humping or adding. However, databases are used to answer any question or query at any time especially that related to the data stored within these rules. Finally, databases also assist to form and collect huge amount of data hierarchically for facilely organization and recovery. It will be the basis for the future projects of the study area.

Paper ID: 042

Experimental Based Approach for Reduced-Order Models of Porous Media Properties Prediction

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Abstract. The pore diameter, type (open or closed), physical properties of Porous alumina ceramic were controlled by varying concentration in the mixture of PMMA with alumina powder. The Porous alumina ceramic was synthesis by a dry pressing method using a microspheres polymethylmethacrylate (PMMA) as a pore-forming agent. The properties of the Porous alumina were predicted using an experimental approach. Afterward, the measured data were used to develop a Reduced-order model (Kriging) to enable a fast prediction of the properties for an extended range of parameters variation and further analysis. The experimental results showed that the High porous alumina ceramics is having an open porosity of 72.27%, and a bulk density 1.204 gm/cm³ and these could be fabricated using PMMA microspheres. Kriging model results showed an acceptable prediction of the experimental-derived data with a maximum discrepancy of 0.02% for the apparent porosity

Paper ID: 043

Seasonal Variation of Some Chemical Quality Indicators Of Drinking Water from Selected Villages Around Zakho District, Kurdistan Region, Iraq

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Absracts. Drinking water samples were taken from 18 villages around Zakho district, Kurdistan region, Iraq in annual seasons of 2018 year and chemical analysis of most important water quality parameters were carried out.Water temperature is varied about 13.2°C to 18.7°C**,** four villages have slight acidic water while other 15 locations are tend to be slight alkaline and highest pH value reaches 8.4, electrical conductivity (µs/cm) is over the permissible values of standard drinking water in two villages and high in 4 location while normal in the rest 13 locations, statistical analysis of dissolved oxygen ranges between 6.73 - 8.40 mg/l, statistical analysis of total hardness revealed that the all villages around Zakho district have hard to intensive hard water over 500 mg/l and gives them a slight bitter taste, calcium hardness gives extremely ranges between 72-392 mg/l, and Mg hardness between 39-250 mg/l, statistical analysis of chloride shows is around 250 mg/l which is typical standard for drinking water, SO_4 is low and their means located between 18-58 mg/l and NO_3 not exceeded 5 mg/l along year months reflecting their purity from pollution. The content of heavy metals Cd, Cu, Mn, Zn, Fe, Ag, Ni, Cr ,Co, are below maximum permissible WHO guidelines and save for drinking while lead is over WHO permissible levels in this rank Mala> Jajoe >Easlam> Bntate> Banee villages and considered a dangerous indicators for drinking water quality in these villages.

Paper ID: 044

Comparative Study of Erosion Wear of Glass Fiber/Epoxy Composite Reinforced with Al_2O_3 Nano and Micro Particles

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Abstract. This work aims at investigating the mechanical characteristics of a glass fiber / epoxy composite reinforced with nano and micro particles of aluminum oxide. The reinforcement volume ratio with the Al_2O_3 powders is 2%, 4% and 6%. Atomic force microscopy techniques has been utilized for measuring grain size of Al_2O_3 nano-powder, average diameter 45 nm and particle size analyzer techniques was 1.914μ_m for macro Al_2O_3 Erosive wear behavior of this composite under three distinct angles of impingement, which are 30°, 60° and 90° and three angular silica sand abrasive particle sizes approximately 425, 600 and 850 μ_m. Results show that glass fiber / epoxy composite reinforced with nanoparticle exhibit higher erosion resistance compared to the composite reinforced with micro-powders. Furthermore, erosion resistance increases with increasing reinforcement with the nanoparticles. Hardness of the nano-composite is also higher than that of the micro-composite.

Paper ID: 046

The Effect of Using Fly Ash on Some Gypsum Plaster Properties

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Abstract. The main objective of this research was studying of the effect of using fly ash as a partial replacement by weight of both ordinary gypsum plaster and plaster of Paris on some physical properties. To achieve this objective, four replacement percentages by fly ash were used (5%, 10%, 15% and 20%), and some physical properties such as standard consistency, setting time, compressive strength, modulus of rupture, expansion and absorption were investigated. For ordinary gypsum plaster mixes, the results shows that using of fly ash improved all investigated properties except compressive strength and modulus of rupture, while for plaster of Paris mixes the results shows that using fly ash led to improve all these properties.

Paper ID: 047

Effect of Mixture of Cement Dust and Glass Sand on Engineering Properties of Expansive Soils under Pavement

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Abstract. Expansive soils represent one of the problematic soils that exhibit high volume change during wetting and drying due to swell- shrink behavior caused a significant problems for structures constructed over them. Numerous materials and methods have been used to improve expansive soil properties to make them more suitable for engineering construction purposes. The natural materials represent more economical materials for this purpose beside the developing and exploiting the minerals ores in the Iraqi lands. The western desert of Iraq is considered as a large rich desert, it riches with many mineral ores. In this research, the ability of using mixture of cement dust which is a waste from Portland cement manufacturing as a primary material and glass sand which is one of the available minerals at the western desert of Iraq as a secondary material for improving the engineering properties of expansive soil under pavement was studied. Results show that adding the mixture of 8% cement dust with 4% glass sand increase the CBR value and improve the swelling behavior of soil. The addition of the mixture of cement dust- glass sand decrease the maximum dry density and increase the optimum moisture content.

Paper ID: 048

Synthesis of Novel Bis (arylthioamido) Pyromellitimide Diamines by Imidization under Microwave Irradiation

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Abstract. Four diamines containing inbuilt imide and thioamide linkages— N,N′-bis[(4,4′-bis(thiourea)diphenyl methane)] pyromellitimide, N,N′-bis[(1,4-phenyl bis(thiourea+*.3)] pyromellitimide N,N′ bis[(4,4′-bis(thiourea)diphenyl ether)] pyromellitimideand N,N′-bis[(4,4′-bis(thiourea)diphenyl sulfone)] pyromellitimide—were synthesized by the reaction of 4-phenylene bis(thiourea) 4,4′-bis(thiourea) diphenyl ether and 4,4′-bis(thiourea) diphenyl sulfone, respectively, with pyromellitic dianhydride in a pyridine/acetic acid mixture using microwave-assisted radiation. Structural characterization of these diamines was undertaken using FT-IR and ^{1}HNMR spectroscopy, along with elemental analysis. The synthesized diamines show good solubility in highly polar organic solvents.

Paper ID: 049

A kinetic Model for Prodigiosin Production by*Serratia marcescens* As aBio-colorant InBioreactor

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Abstract. Microbial pigments have promising applicationsin many industries such as pharmaceutical cosmetics and food processing. Among these pigments, prodigiosin, the red pigment that produced by *Serratia marcescens,* represent one of the valuable pigment due to a large industrial and medical benefits. In this study, growth kinetic of *S. marcescens* in a 7L bioreactor in an optimized medium was investigated. The result showed that the maximum cell mass and prodigiosin were 14.4 mg/mL and 594.88 mg /L respectively. The batch fermentation kinetics was studied via developing a simple model based on the Luedeking–Piret correlation for prodigiosin yield, Logistic correlation for biomass formationand Luedeking–Piret-like correlation for substrate consumption with correlation coefficient of 0.996, 0.9989 and 0.9964 respectively. The partially purified prodigiosin was tested for its ability to dyeing different types of textiles The Methanolic extract of prodigiosin was able to color wool, cotton, silk, nylon and polyester with the same degree of acquiring color. The result showed that the color of all types of pigmented textiles were stable in the acidic (pH 3) and neutral pH and reduced in the alkaline solution at the basic pH greater than 13. In addition, the pigment textiles maintained their color when exposure to bleaching upon treated with detergents and high temperature (100^{o}C) whereas, they were sensitive when exposure to light. our finding confirms previous findings and contributes additional evidence on using prodigiosin as a promising ecofriendly bio colorant of textiles.

Paper ID: 050

Study of the Influence of Solvent and Irradiation Effects on the Photo -Degradation and Photo-Oxidation of Poly (4-phenyl styrene)

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Abstract. The photodegradation of poly (4-phenylstyrene) was investigated as function of different irradiation times and in solvents of different polarities. Irradiated polymer solutions at 288 nm, using dichloromethane, dichloroethane, tetrahydrofuran and dimethyl formamide, were investigated with absorption and fluorescence spectroscopic methods at room temperature and in presence of oxygen. Irradiated polymer solutions showed a noticeable decrease in the absorption intensity of the excimeric fluorescence band, and change in the structure of excimeric fluorescence band. The changes are due to the formation of photo-products as a result of photo-degradation and photo-oxidation processes, in presence of air. Added plasticizers caused a noticeable enhance in the intensity of the fluorescence main band , using dichloromethane, dichloroethane and tetrahydrofuran solvents, while it showed an increase in case of using dimethyl formamide solvent. The polymer fluorescence main band showed a considerable decrease in its intensity by the decrease in the polarity of the used solvents, and to accelerate degradation process. The suggested mechanism accounts the effect of the increase in exposure time on photodegradation and photo – oxidation processes in polymeric chains.

Paper ID: 051

Influence of DPSS Laser Radiation with Different Power Densities and Exposure Times on Erythrocyte Sedimentation Rate– An In-Vitro Investigation

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Abstract. Laser light irradiation is assumed to have bio stimulating impact in different cell varieties. However, there is until now an absence of knowledge concerning the response of RBCs to laser light irradiation and the mechanism isn't completely seen up until this point. This study was designed to assess the effects of DPSS yellow laser light therapy irradiation on Erythrocyte Sedimentation Rate (ESR) in vitro and examined exposure time and power density reciprocity effects on ESR value and find the optimum dose that exhibit the best response. A total of 40 fresh blood samples were collected from healthy adult volunteers by venipuncture into tubes containing anticoagulant EDTA. Photoradiation was administered using 589nm DPSS yellow laser varying both power density and exposure time. Each sample was separated into five equivalent aliquots to be utilized as control (without radiation) and irradiation blood samples. The ESR variation was tested for two different experimental methods: the irradiation of whole blood (RBCs and plasma) and the irradiation of plasma. The ESR and RBCs counts values are checked before and after laser irradiation. Following irradiation, a variation of some erythrocyte indices were observed. Statistically, the comparison results showed that the most significant difference in ESR ($P<0.0001$) occurred using 25 minute at 26 mW/cm². The optimal dose value was noticed at 39 J/ cm² for both irradiated the whole blood and irradiated the plasma samples when compared with non-irradiated blood samples. ESR of irradiated plasma is found to be more significantly decrease than their irradiated whole blood samples. It can conclude that DPSS can reduce in ESR depend on changes of exposure time more than changes of power density. The result also shows that ESR reduction exposed to DPSS laser is depend mostly on radiation of plasma than the irradiation of whole blood.

Paper ID: 052

Preparing and Diagnosing Some Schiff Bases and Evaluating Their Biological Efficacy

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Abstract. The first was prepared from 3- hydroxy benzaldehyde with 4-nitro aniline .the second was prepared from the P-chlorobenzaldehyde reactor with 2,5-dimethylaniline. Exclude it from Salicylaldehyde reactor with 2-chloro aniline, (7) hours for each base and add (3-5) drops of acetic acid ice to increase the speed of chemical reaction in the preparation of these rules where it was confirmed that these rules through the spectrum of infrared radiation, where the package appeared C = N, which indicates the formation Rules of Chef. The biological effects of these bases were also carried out using a variety of bacteria and using a DMSO solvent.

Paper ID: 053

Preparation and Characterization of Graphene Sheet Prepared by Laser Ablation in Liquid

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Abstract. A graphene sheets were prepared successfully by Nd:YAG laser ablation of carbon target immersed in de ionized water at room temperature and under normal pressure, followed by re-irradiation of the obtained suspensions using the same laser and the same laser energy . The structural chemistry was revealed by Fourier transform infrared spectroscopy (FTIR) and x-ray diffraction (XRD) analysis, and proved the graphene sheet formation. Optical properties were investigated by measuring the photolumenance PL and UV-VIS spectrum. The Morphological measurement were investigated by Transmission electron microscopy TEM in which TEM images show the synthesized of graphene sheet at assorted pulsed laser energy

Paper ID: 054

Gravel Powder Effect in Reinforced Aluminum Alloy Matrix Composite

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Abstract. The modern engineering applications looking forward using the materials with low-cost, naturally available, and have significant mechanical properties to reinforce aluminum alloys. Gravel particles are considered as one of the most available materials in nature, which possess high mechanical properties such as stiffness, hardness, toughness, ultimate tensile strength, etc. In the present study, the effect of gravel powder content on both mechanical and wear properties of Al alloy matrix composite were investigated. Aluminum with 4 vol. % copper particles were used as the matrix and reinforced by 0, 4, 8, 12, and 16 vol. % gravel powder. Powder metallurgy route is used to manufacture the composites. The composite samples were characterized by utilizing a Scanning Electron Microscope (SEM), Energy-Dispersive X-ray (EDX) analyses, and elemental mapping analysis. The wear test was obtained under the different time of 10, 20, and 30 min at a constant load of 20 N. The results showed that the composites density decreases and the porosity increases with improving in gravel powder content. Furthermore, it was found improving in hardness, diametral compressive strength, and wear resistance by enhancement in gravel powder content. Whereas increasing in wear time results deterioration in wear resistance.

Paper ID: 055

Employed Recycling Materials for the Fabrication of Smart Mortar

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Abstract. In this research, smart cement was fabricated with metallic powders recycled additives from industrial sources to increase the electrical conductivity of the cement mortar and hence, to increase its use in the smart applications. The Ordinary Portland Cement (OPC) was adopted in order to prepare the control and the modified cement mortar samples with recycled additives, where the cement: sand mixing ratio was 3:1 and the water cement ratio W/C was 0.5. The added replacement ratios of silicon and aluminum recycled metallic powders were (0.5, 1, and 1.5) wt% and the procedure for molding and curing took periods of 7 and 28 days, respectively. After the curing and drying, the structural, mechanical and physical properties were examined beside the electrical properties. The results showed that most properties of smart cement were improved compared with the cement mortar control. In particular, the electrical conductivity values increased significantly at the low frequencies of the aluminum additives and silicon especially at the high additive ratio, which makes our recycled materials effective in the classification of this smart cement.

Paper ID: 056

Ultrasonic Waves Estimation of Strength Properties Based on Cementitious Materials in Self-Compacting Concrete

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Abstract. It observed growth and attention increasing in the tests of non-destructive concrete to evaluate the concrete in many countries. One of them is ultrasonic pulse velocity (UPV), but it did not include investigating Portland cement replacement by pozzolanic materials in case of adding a new material alum sludge (AS) as a pozzolanic material and its effect on the characteristics of self-compacting concrete (SCC) as a binary or ternary blends. This addition can be created significant changing in the concrete hardening process when the alum sludge is employed. Thus, this study aims to detect the changes in the strength by conducting repeated measurements of UPV at different ages. Investigation the influence of replacement cement by four pozzolanic materials in the production of SCC, first of all, was by Treated alum sludge (TAS) with 5, 10, 15, 20, and 25 weight percent of cement. Next by silica fume (SF) was at 5, 10, and 15 weight percent of cement. Then fly ash (FA) and natural zeolite (NZ) were at 5, 10 and 15 weight percent of cement. In achieving the aim of the study, the experimental work divided into 48 mixes as well as three control mixes that contain three different levels of water (180, 190, and 200 kg/m3). Results showed that the values of UPV indicate the changes in the strength by increasing in strength with the period. UPV and the crushing compressive strength of SCC are related, and the correlation coefficient was determined for the proposed equations. There was no unique relationship can be established to cover all SCC specimens. However, it is observed that with a specific level of water to cement ratio as well as a range of strengths, certain clear relationships can be established and used without a need of the destructive test.

Paper ID: 057

Corrosion Behavior of Some Jewelriesin Artificial Sweat

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Abstract. The corrosion behavior many of metallic materials used as jewelry in synthetic sweat solution was studied by electrochemical polarization method. Results showed that the sample (Cu-Fe alloy) has the majority corrosion potential (Ecorr) in negative beside the highest current density (icorr) as well as the current density reached to 366.13 μA.cm-2, While (Red brass) has the noblest corrosion potential in addition the current density of corrosion is very low ,and reached to 11.080 μA.cm-2 .The surface morphology of the surface of corroded specimens was analyzed using scanning electron microscope to show the product of corrosion with damage on the surface of the material.

Paper ID: 058

Replacement of Natural Sand in Mortar by River Sand: Mechanical Properties

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Abstract. The high cost of natural sand in some countries cause to the engineers and researchers to investigate the possibility and feasibility of using other materials to be used as a fine aggregate in concrete mixes. This work aims to provide a better understanding of the mechanical behavior of mortar under loading (compression, direct tension and flexural moment). In Iraq, there are many cities placed along the Tigris and Euphrates, therefore can be obtained a lot of quantities of river sand that result from cree and clean these rivers which is considered a cheap prices material, it is used in agriculture only. The most of natural sand in Iraq contains high sulfur trioxide (SO_3) which is exceed the Iraqi Standard Specifications [IQS No. 45, 1984], it is (0.5 %).This work explains the influence of river sand on the mechanical behavior of mortar which replacement of natural sand. Four groups of specimens have been realized within a water cement ratios of 0.48, 0.52, 0.58 and 0,6. One group is considered as reference: these specimens without river sand, natural sand only. Other groups have been river sand that replacement of natural sand of 25, 50 and 75 %. All manufactured specimens have the following dimensions for cubes (50 * 50 * 50 mm), prisms (40 * 40 * 160 mm) and bon dog (25 * 28 * 70 mm). In this work, some tests are used for materials and specimens for examples sieve analysis and flow test for materials. Compression test, flexural test and bon dog test have been designed for specimens.Finally, the experimental results are presented in relationships, histogram and tables between mechanical properties and the replacement of river sand. The results show the effect river sand on the mechanical properties positively until 25 % but this this behavior becomes negatively when this value becomes higher than 25 %.

Paper ID: 059

Study Effects of Doping Copper in NiO Nano Structures Thin Film on their Optical and Structural Properties

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Abstract. Thin films NiO doped by (2, 4, 6, 8) % Cu are prepared from the solution of nickel nitrate Ni (NO3)2.6H2O) and copper nitrate (Cu (NO3)2 .3H2) deposited on a glass substrate by homemade chemical spray pyrolysis at 400oc with thickness 200 nm. The structural and optical properties are studied by (XRD), (AFM) and Ultraviolet spectroscopy. The results of (XRD) showed that all the prepared films are polycrystalline monoclinic crystal structure with a preferable direction was (111); and that the average of crystal size rates may decrease with increasing doping rates with a little change in the values of the lattice constants and the diffraction angles, while the results of (AFM) indicate that the particle size and roughness of the surface decrease with doping. The results of (UV-VIS) spectroscopy show that the absorbance increases, while transmittance decreased by increasing the doping ratio in the wavelength range (300-900 nm). It has also been found that the absorption coefficient increased by increasing doping ratio, while the optical energy gap for allowing direct transmission decreased by increasing doping ratio from 3.3 eV to 2.9 eV.

Paper ID: 060

Properties of Self-Compacting Mortar Containing Nano Cement Kiln Dust

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Abstract. Micro voids inside the cementitious materials mortar matrix drastically reduce the load carrying capacity of the mortar. Furthermore, the weak interface between the aggregate and mortar will promote the micro cracks initiation and cracks propagation. In this study, a nano cement kiln dust was added to the self-compacting mortar to enhances the microstructure of mortar and reduce the micro voids effectiveness. Nano cement kiln dust was prepared and used as additives to the self-compacting mortar in (1, 2, 3, 4, 5) wt. % to be used as cementitious sustainable materials. Cement kiln dust was prepared by grinding process until achieving to nano particle size, nano particle size was provided and checked by AFM and FESEM tests. Some self-compacting mortar properties was tested at 7, 28, and 90 days' age. Fresh properties of the self-compacting mortar were evaluated by using mini flow table test and mini v-funnel test. The experimental results of self-compacting mortar shown that the mechanical properties which includes the compressive strength, direct tensile strength and flexural strength were increased as nano powder percentage increases. The physical properties such as porosity and total water absorption was decreased with the increase of nano powder contents. Dry density of the self-compacting mortar increased as nano powder percentage increase. The microstructure homogeneity and nano powder distributions of self-compacting mortar were explained by using FESEM images.

Paper ID: 061

Enhancement of SI Engines Performance Operating With Gasoline Fuel Using High Octane Additives from Waste Materials

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Abstract. Fuel property is an important indicator for the fuel suitability to utilize in an internal combustion engine. It can influence the combustion efficiency and fuel consumption directly. In this study, investigation of the effect of fusel oil additive with commercial gasoline at different ratios on the properties of fuel blend and SI engine performance based on gasoline fuel as a threshold for comparison. The engine performance test was conducted at increasing speed and constant half load. Study results reveal that fusel oil has a higher density while the blended fuel samples have a density value closed to that of petroleum with a similar trend of change of viscosity. The higher measured octane number indicated for fusel oil with a value of 106 and the lower octane number for petroleum fuel is 86, which is less than that of fusel oil by about 19%. On the other hand, the higher measured energy content indicated with petroleum fuel at a value of 45.5 MJ/kg while the lower energy content for fusel oil of 29.5 MJ/kg which is lower than that of petroleum fuel by about 33%. Moreover, it can be seen that the energy content of blended fuel decreased with increasing fusel oil additive ratio to 5% and 10% respectively. Engine test shows an increase in brake power at low speed of 1200 rpm by 9% and 15% with PF5 and PF10 respectively compared to pure petroleum, which further enhanced with increasing engine speed. Slight variation in BSFC observed with the increasing additive ratio at medium engine speed with less variation at low and high engine speed at lower BSFC for petroleum fuel over the whole engine speed. Finally, significant variation in engine BTE observed with increasing additive ratio in the blend with gasoline, which indicates significant improvement in the fuel combustion efficiency.

Paper ID: 063

Temperature Changes During Irradiation of Ho:YAG Laser Lithotripsy In an In Vitro Urinary Bladder Model

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Abstract. Urinary tract stones are one of the most common painful disorders of the urinary system. Many technologies were used for the treatment of these stones which include: Electrohydraulic lithotripsy, ultrasonic lithotripsy, extracorporeal shock wave lithotripsy, and laser lithotripsy. This study was aimed to evaluate the temperature change during laser lithotripsy with different laser settings, different distances between the fiber tip and the thermometer and to study the influence of irrigation on temperature changes with different states of irrigation rate. The experimental system consisted of an 80W holmium laser (OMNIPULSE MAX) lithotripsy with a 365µm laser fiber that introduced through the laser port of cystoscopy. The cystoscopy was inserted through one end of PVC tube and the other end for the insertion of the thermometer (K-type) that used for temperatures recording. In conjunction with the thermometer, Seek Thermal Imager was used for thermal evaluation. A Normal saline fluid was suspended at 75cm from the water tank for gravitational and irrigate (at room temperature) through the working channel of the cystoscopy at different flow rates. The following settings were explored: 0.375J x 20Hz, 0.675J x 20Hz and 1J x 20Hz at two different distances between the fiber tip and thermometer 0.5&1 cm. During each setting the laser was fired for 70 seconds and the measurement of temperature was taken for each 10 seconds increment. The irradiation of Holmium laser showed temperatures changes and the values of these changes depending on different parameters that used in this study. Statistically, all three parameters (pulse energy, irrigation rate and distance) showed highly significant effect on measured temperatures. The maximum temperature was recorded at no or low irrigation rates with higher laser settings and closer distance from thermometer that was over 70℃, this temperature crossed the toxic threshold (43.4°C) that will cause tissues damage. Ho:YAG laser might be safe provided when there was sufficient irrigation with optimal selected laser power which will minimized the probability of tissues damage that will occur due to of high temperatures rise.

Paper ID: 064

Removal of Eriochrom black T from aqueous solution using Al_2O_3 surface: linear and non-linear isotherm models, error analysis and Thermodynamic studies.

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Abstract. A comparison of linear and non-linear regression method to find the best fitting isotherm studied using the experimental data for adsorption of Eriochrom Black T on the Al_2O_3 surface. So three error function used: the Standard Deviation, Sum of the squares of the error, and Root mean square error. The error values suggest that the non-linear method is an appropriate method to describe the adsorption of the Eriochrom Black T on the Al_2O_3 surface. The result shows that Langmuir isotherm was the best isotherm to describe the adsorption process. The thermodynamic parameters showed that the process was spontaneous, and endothermic under the studied conditions.

Paper ID: 065

Cementation of Oil Wall from co- Friendly Waste Natural Materials

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Abstract. In this work, the most important environmental pollution problems were through the preparation of environmentally ecofriendly green cement consisting of natural waste rice husk ash (RHA) in various additives (0.0.25,0.5,0.75.1.1.5%). The mechanical properties of the specimens were measured and the percentage of increase in natural waste (ash rice husks) was found to increase the compression strength and the hardness of the cement mortar and decreased in the absorption of crude oil and after coating it with a mixture of sodium silicate with 5% with rice husk ash (RHA) for the purpose of Cementation of Oil Wall so as to obtain a clean and green environment without pollution and reduce the emission of CO_2 to the atmosphere when mixing cement with water.

Paper ID: 066

Poly (vinyl chloride) Matrix Membrane Sensors for the Quantification of Cyclizine Hydrochloride in Pure and Pharmaceutical Preparations.

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Abstract. For the selective potentiometric a PVC membrane sensor was useful for determination of cyclizine with no preceding divorce or pretreatment. The suggested method is accurate, sensitive, precise and simple. It does not need any cultured. The sensors were prepared based on cyclizine (CYC) and phosphotungestic acid (TPA) ion-pair complex as the electro-active materials. Some of the selected plasticizers were used such as: Di-butyl phthalate (DBPH), Tri-n-butyl phosphate (TBP),O-Nitro Phenyl Octyl Ether (NPOE) in PVC matrix. The sensors parameters, linear range of concentration, Nernestian slope, limit of detection, response time, life time, and selectivity were evaluated. PH influence was also studied at different concentration for electrodes which depended on NPOE, DBPH, TBP as a plasticizers.

Paper ID: 068

Kinetics and Mechanistic Studies of the Formation of Pyrrolidines from the Reaction some Chalcones with N-Benzylidene benzylamine

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AbstarctA series of chalcones (1,3-diaryl-2-propen-1-one)had been prepared using Claisen-Schmidt condensation and Schiff base (N-arylidene benzylamine) had also been prepared to be used as a nucleophiles after treatment with strong base (alc.NaoH)through the 1,3-anionic cyclization by the addition to chalcones to afford the expected corresponding heterocycles (pyrrolidines to simplify the kinetic study of 1,3-anionic cycloaddition of Schiff bases to chalcones the reaction was considered as a pseudo-first order reaction is a consecutive one which include an intermediate formation that will suffer from intramolecular cyclization to afford the expected heterocycle(pyrrolidine). The rate constants depend on different variables such as different substituent groups and steric hindrance introduced by the aromatic ring of reactants. Variation of the rates with temperature were also studied. Arrhenius plots were performed and gave a straight lines which resulted in exact determination of Arrhenius parameters and entropy of activation. A mechanism route for the reaction was suggested.

Paper ID: 069

Diffracted Light of Acousto-Optic Filters Using Transfer Function by MATLAB R2018a

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Abstract. We appraisal the responsibility of acousto-optic and spatial filtering for high-pass spatial filtering, classically, acousto-optic interactions include scattering of photons by active phonons into upper and minor orders. The theory of weak interaction frequently describe diffraction of Bragg regime as the propagation of a uniformly plane wave of light through a uniformly plane wave of sound, resulting in the famous capital zeroth and first order of diffraction. Our commencement dissection of the environment diffraction of wave and photon scattering from a Bragg cell a smaller amount than intensity feedback with light beams indicates that the diffracted (up shifted photon) light continues to preserve the probable (uniform plane wave) behavior versus the optical phase shift in the cell inside a little range of the Q-parameter, and at larger Qs, begins to move away. By the formalism of transfer function, the beams' middle asymptotic axial shift as predicted was studied.

Paper ID: 070

Structural and Optical Properties of Nanocrystalline SnO_2 Thin Films Growth by Electron Beam Evaporation

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Abstract. SnO_2 thin films Electron Beam Evaporation techniques prepared nanocrystalline, these films analyses by XRD, UV-Vis, and AFM. The effect of Annealing temperature shows various phases (structures and morphologies). The optical transmission (T %) in the range (190-1000) nm of films prepared was measured. SnO_2 thin films show a direct allowed transition and decreased the energy bandgap from 3.75 eV before annealing to 3.62 eV and 3.27 eV after annealing. Through the results, we found that all studied characteristics were affected by the annealing process.

Paper ID: 071

Calculations of Precipitation Efficiency for Air Pollution Control Systems (Electrostatic Precipitators)

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Abstract. Air pollution control devices vary in terms of the principle of their work and the factors affecting the efficiency of their performance. Some of them work according to the principle of gravity, such as the settling chamber, which works according to the effect of centrifugal force such as Cyclone, and others work according to the principle of filter cloth and insulation. The dust from the fabric fibers to form a cake layer acts as an additional filter, such as bag filters, and the electrostatic precipitators act according to the principle of ionization in the corona (electrical discharges produced when a high voltage passes through a conductor wire passing through a medium) (Gaseous at atmospheric pressure) and thus the formation of ions, (The Cull Code), the dust particles are separated and collected because of the charge they carry, as well as wet scrubber systems that operate in a fluid manner Water or other liquids, for the purpose of capturing dust particles or gas molecules.

Paper ID: 072

The Effects of Earthworm powder on viability of *Entamoeba histolytica* (Trophozoites) *in Vitro*

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Abstract. This study was accomplished in vitro to measure the viability of trophozoite by using Methylthiazol Tetrazolium (MTT) assay after the parasite was saved in vitro by using Locke-egg medium (LEM), when the parasite was treated, different concentrations of the earthworm powder were used (50,100,150,200 mg/ml) in different times (24, 48, 72 hours). Results showed the viability of trophozoite in (50 mg/ml) after (24, 48, 72h) was (74 %, 78 %, 70 %) respectively compared with control (100 % 99 % 95%) respectively, also in (100 mg/ml) after (24, 48, 72h) was (60 %, 43 %, 49 %) respectively, in (150 mg/ml) after (24, 48, 72h) was (40 %, 31 %, 35 %) respectively, in (200 mg/ml) after (24, 48, 72h) was (26 %, 20 %, 30 %) respectively compared with control while in metronidazole (24, 48, 72h) was (5 %, 4%, 3%) respectively compared with control.

Paper ID: 073

Assessment of Heavy Metals Pollution in the Shatt Al-Arab River, Basra-Iraq

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Abstract. Nineteen stations were selected along Shatt Al-Arab River (SAAR) to measured the concentrations of six Heavy Metals (HM) elements which were (Cd^{+2} , Cu^{+2}, Fe^{+2}, Ni^{+2}, Pb^{+2}, and Zn^{+2}), the samples were taken from subsurface River water in the summer season of 2017 and in the period of ebb, the samples were taken as dissolved in water only. The concentrations of reported HM s were compared with Iraqi standards of drinking water number 417, 2009. HM s Pollution Index (HPI) and Metal Index (MI) were calculated in this study to assess the rate of contamination by the HM in the water. The Results of field measurement showed that the mean values of the previous HM s along the River were (1.275, 3.211, 171.598, 6.400, 0.602, 6.725) µg/l, respectively, and the calculated average values of HPI and MI were 33.927 and 1.383 respectively, that indicated the average value of HPI was below the allowable limit which is equal 100 and the mean value of MI was found within the zone of slightly affected characteristic. However, there were some stations in the SAAR shown contaminated by HM s that are possibly due to domestic wastewater or soil-water interaction. The HPI in all stations that calculated in this study were ranged between 4.2 to 132.9 and MI were ranged between 0.3 to 3.2, the values of previous metalsin most samples were found under the ultimate limit of Iraqi standards, that means the water samples selected along the River were not contaminated regarding HM s. The objective of this study is to make knowledge for the HM s levels in nineteen station along SAAR and calculate HPI and MI then interpolate graphically between them using the technique of IDW in the Geographic Information System (GIS) in order to have an idea about the situation of contamination of the area under study.

Paper ID: 074

Effect of Acidic Treatment on Rheological Properties of Iraqi Attapulgite Clay

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Abstract. Acidic treatment has a great influence on attapulgite clay rheological properties. The attapulgite characteristics such as purity, morphology and desperation of attapulgite clay are wholly controlled by acidic treatment. In this work, the purification of Iraqi attapulgite clay to be suitable in drilling fluid was investigated using acidic treatment. Three types of acid (acetic acid, citric acid and hydrochloric acid) with different concentrations ((0.1869, 0.3064and0.4788) M citric acid,(0.5, 0.911 and 1) M hydrochloric acid,(0.911, 1.138 and 1.518)M acetic acid) were used. XRD and FE-SEM tests were utilized to study the attapulgite morphology while the rheological properties were tested using Ofite viscometer. The results show that the citric acid treatment had harmful influence on attapulgite morphology and led to serious reduction in its rheological properties. While; the use of hydrochloric acid had slighter impact than citric acid on attapulgite morphology. Therefore, the attapulgite rheological properties were better. In this work, the best result obtained by using acetic acid due to its ability to remove whole calcite mineral without causing any damage on attapulgite morphology. The yield of clay for purified attapulgite were **(**60.35, 63.97, 101.94) barrel/ton for attapulgite treated with (0.3064M) citric acid, (0.911M) hydrochloric acid and (1.138M) acetic acid respectively using distilled water; while, the yield of clay was (58.3, 70.59, 91.93) barrel/ton for same concentration of citric acid, hydrochloric acid and acetic acid respectively using salt water.

Paper ID: 075

Solidification Enhancement of Phase Change Material Implemented in Latent Heat Thermal Energy Storage

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Abstract The emphasis of this current study is to perform a numerical simulation of the solidification behaviour of phase change material for the latent heat thermal storage unit has shell and tube design in order to improve the thermal performance of the latent heat storage unit. A comparison has been carried out for the storage unit using two different alignment, essentially, horizontal and vertical for two configurations plane one (non-finned) and finned one. The outcome results were compared with the experimental results in order to validate the model. Moreover, the transit temperature profile was also presented in this study to get a better understanding for this particular process. The predicated results were shown a good agreement with experimental data that used. The results indicated that when fins is installed solidification process time enhanced with an average percentage of 60% the effect of alignment during solidification process is insignificant for both cases of finned and plane LHSU. It is worth to mention that this study can be used to improve the understanding the thermal performance of the phase change material and to reduce the efforts of the experiential trails in the future investigations.

Paper ID: 076

Some Biochemical Markers and Methylene Tetrahydrofolate Reductase Gene Polymorphism That Association with Different Type of Smoking

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Abstract. The phenomenon of smoking starts to increase very fast around the world. This increase in smoking comes with the increase of use of the different kinds of tobacco among the people who are smoking in Iraq of this research was to assess the connection and interaction of genotypic polymorphism in methylene tetra hydrofolate reductase gene in C677T position with different type of smoking.Two distinct test tubes used to gather venous blood samples from each topic, one was used for biochemical analysis and the other EDTA tube used for DNA extraction. From all samples patients and control subjects the Genomic DNA was isolated from blood. By Bio drop DNA concentration and purity were determined measuring done, and validate the concentration of DNA for PCR reaction. By using agarose gel electrophoresis the quality of the DNA was determined and stained with Red safe DNA, at -20 °C all samples were stored until further utilization. The current study showed increase hematological test and biochemical parameters in smokers compare with control subject.In this study about the polymorphism of MTHRF/C677T gene, the results show that there is a mutation C266T in all groups of study, but in different percentage, the highest percentage for the Genotype TT is 30 % for those who smoke both Hokka and cigarette. While the Genotype CT for those who just smoke Hokka is considered the highest one 20%, and the percentage for Genotype CT and TT for those who just smoke cigarette is considered the lowest one which is just 10% for each Genotype. In this study, MTHFR gene polymorphism associated with different type of smoking. In addition, we found an association between the *MTHFR* C677T polymorphism variant genotype (TT) and increased risk disorders in smokers.

Paper ID: 077

Study of the Mechanical Properties of Polyvinyl Alcohol /Starch Blends

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Abstract. In this current study,Poly (vinyl alcohol) (PVA) / corn starch (St) blend films was prepared by solution casting process. The starch content with different weight ratio (25, 30, 35, 40, 50) wt % was added to PVA. LARYEE tensile testing machine was used to examine tensile properties of the blend. The result shows the starch incorporation reduced the elongation at break and tensile strength and but young's modulus increased. The results were enhanced with optical microscope micrographs.

Paper ID: 078

Modeling of Adsorption Isotherms of Oil Content through the Electrocoagulation Treatment of Real Oily Wastewater

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Abstract. The adsorption equilibrium isotherms of oil content via the electrocoagulation treatment of real oily wastewater were studied and modeled. Ten isotherm models (Langmuir, Freundlish, Temkin, Dubinin–Radushkevich, Kiselev, Fowler–Guggenheim, Elovich, Hurkins-Jura, Jovanovic and Hill–de Boer models) were selected to predict the adsorption equilibrium isotherms and their characteristics parameters. A triple aluminum tubes was manufactured in a monopolar-concentric arrangement to investigate the purpose of treating real oily wastewater (523.11 ppm of oil content) produced from crude oil wells location (West Qurna 1 /Basra-Iraq) under the impacts of the operational variables; the electrolysis time (2-20 min.), the current density (4.4 mA/cm^2), the initial pH equaling 6.5, and the agitation speed fixed as 200 rpm. The results showed that the studied models fitted the data in the order as: Freundlish (R^2=0.9991) > Langmuir (R^2=0.9960) > Hurkins-Jura (R^2=0.9926) > Temkin (R^2=0.9922) > Elovich (R^2=0.9906) > Jovanovic (R^2=0.9573) > Fowler–Guggenheim (R^2=0.8676) > Hill–de Boer (R^2=0.8294) > Dubinin–Radushkevich (R^2=0.7928) > Kiselev (R^2=0.7366) isotherms. The modeling of adsorption isotherm revealed that the interaction of oil content with the electro-coagulant is characterized as physical adsorption process. There is no formation of complex between the adsorbed molecules due to the repulsion among them. Additionally, the heat of adsorption will decrease with loading via the electrocoagulation treatment of real oily wastewater.

Paper ID: 079

Spatial and temporal Variation of Water Quality Index of Euphrates River in AnbarGovernorate, Iraq

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Abstract. This study aims to investigate the spatio-temporal variation of water quality index (WQI) of Euphrates River in Anbar Governorate. The water samples were collected from nine stations in 2018.Fifteen water quality parameters namely, pH , temperature (T), turbidity (TUR) dissolved oxygen(DO) ,electrical conductivity (EC) , total dissolved salts (TDS) , sulfate ion (SO42-), Chloride ion(Cl) ,nitrate ion (NO3-),Phosphate ion (PO4), total hardness (T.H), Alkalinity (Alk),calcium (Ca2+), magnesium (Mg2+), and total bacteria (TB) were measured for calculation of the WQI using the methodology of Canadian Council of Ministers of the Environment Water Quality Index (CCME WQI) . The WQI level of Euphrates River in the study area during 2018 ranges from 43.33 to 64.8 with mean of 55.10. According to the mean value of WQI, the water quality is mostly classified as "marginal" for overall drinking water utilities in the period of research. In general, the result of temporal variation analysis of WQI shows ″ marginal ″ water quality in most months, except of January and September, the water quality is fair and poor, respectively. The result of the spatial variation analysis exhibits marginal water quality in all sampling stations and the WQI value decreases in the downstream stations. Compared to the result of a previous study, the water quality of the Euphrates River in the research region retained its marginal status. The deterioration of Euphrates River water can be ascribed to anthropogenic activities.

Paper ID: 080

Investigating the Mechanical and Microstructure Properties of Ceramic- PMMA Polymer Composite

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Abstract Poly methyl methacrylate PMMA is the most widely used material for fabrication of denture base and other application in human body due to good biocompatibility properties, the main problem associated with using pure PMMA material is poor mechanical properties under high loads. The ceramic material Alumina (AL2O3) and multi walled carbon nanotube (MWCNT) using are added to improve the mechanical and biocompatibility properties of PMMA polymer matrix. The mechanical, morphology and biocompatibility properties of composite materials with different concentration 100%PMMA, 99%PMMA+1%AL2O3, 99%PMMA+1% CNT and98%PMMA+1%AL2O3+1%CNT were studied. The mechanical properties of polymer system were improved when mixing with either ceramic particles Al2O3 or CNT on their own .The composite 99%PMMA+1%Al2O3 sample have good mechanical properties such as , the hardness HV 80.4Kg/mm^2 , low density1.098 g/cm^3 and 0.33 porosity, the Scaninc electron microscopy(SEM) and optical morphology indicate that the Al2O3 particles arrangement homogenous at the grain boundary of polymer matrix. The In vitro test shows the present porosity was enhanced from biocompatibility and Osseo integration of the surface sample.

Paper ID: 081

Correlation study of (IL-17 , IL-17RA) and Some Biochemical Parameters With Patients of Iraq colorectal Cancer After and Before Taking a Dose of Chemotherapy.

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Abstract. Colorectal cancer CRC is the third most commonly diagnosed cancer in males and the second in female, so it is a common and life-threatening disease serum of 48 males and 40 females suffering from CRC disease as group one (G1) without taking a chemotherapy dose, the same patients group tow (G2) after taking the first chemotherapy dose, while group three (G3) whose patients in (G1) and (G2) after second taking a chemotherapy dose and group four (G4) consist of (30 males and 30 females) healthy Iraqi control . Results showed a significant increase in IL-17, IL-17RA and CEA in G1, while there was a significant decrease in vitamin D concentration in G1 than other groups, also there was positive (+ ve) significant correlation between IL-17 and CEA in male and female patients in G1.

Paper ID: 082

Enhancement the Octane Number of Light Naphtha by Adsorption Process

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Abstract. Many invitations for stopping use tetraethyl lead (TEL) and methyl tertiary butyl ether (MTBE) as an enhancer of octane number due to their effects on the environment and human health. An adsorption process used to separate the low octane number component (normal paraffin) by using a molecular sieve (5A) in a fixed bed column. In this paper light naphtha used as a feedstock for this separation method. The study was performed in the vapor phase with changing many parameters such as pressure (1,1.6) bar, temperature (150,180,210) °C, and feed space velocity (1.384, 2.769,3.095) hr^{-1}. After many experiments and the comparison between breakthrough curves, the best conditions for normal paraffin removal from light naphtha were at operating pressure (1.6 bar), temperature (180 °C), and naphtha feed space velocity (1.384 hr^{-1}). The weight percentage of normal paraffin in the feedstock was (47.525). The best result for the separation of normal paraffin under the best condition was (3.63091) this led to an increase in the research octane number value of light naphtha from (60.5) to (83.94). The increasing magnitude was (23.44).

Paper ID: 083

The Influence of Using Hybrid Elastomer and Plastomer Polymers Modifiers, Aggregate Gradation and Mineral Fillers on Moisture Sensitivity Resistance of Asphalt Concrete Mixtures

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Abstract. Moisture damage can be defined as the loss of strength of asphaltic mixtures that resulted from the presence of water. The main objectives of this research is to investigate the influence of using hybrid elastomer and plastomer polymers modifiers, aggregate gradations and mineral fillers on moisture resistance of asphalt concrete mixture. In this study, 1% and 3% of plastomer Polyvinyl Chloride (PVC) were added for both pure asphalt binder and asphalt modified with 3% of elastomer Styrene Butadiene Styrene (SBS) to form hybrid polymers. Two types of mineral fillers were used: portland cement and limestone dust with two types of aggregate gradations: fine and coarse. A Humboldt Machine was used to measure the maximum load which makes the specimens completely fractures and then to estimate the Tensile Strength Ratio (TSR). The results of the study depict that the hybrid polymers improve the tensile strength ratio. This give an indication that hybrid polymers have great effect on improving the performance of modified asphalt binder. Also, results show that hybrid polymers improve the properties of flexible pavement against moisture damage and as a result increasing the durability and the service life of the pavements. According to that, it is concluded that modifying asphalt with hybrid polymers is more preferable to be used as anti-striping. Furthermore, it is deduced that fine gradation mixtures is more resistance than coarse mixtures to moisture damage. It is also recommended to use portland cement instead of limestone dust as mineral filler material in HMA.

Paper ID: 084

Enhancement Rheological Properties of Asphalt Binder Modified with Hybrid Polymers According to Superpave System.

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Abstract. Asphalt is a complex mixture consisted of physical phases and composed of hydrocarbons and nonmetallic derivatives. Due to the effects of vehicle loading repeated and cycling of temperature, neat asphaltic concrete pavements are exposed to cracking and rutting, therefore; modification of the neat asphalt is generally required. The main objectives of this research is to investigate the influence of using hybrid elastomer and plastomer polymers on rheological properties and chemical bonding of the asphalt binder. In this work, 1% and 3% of (PVC) (Polyvinyl Chloride) were added for both pure asphalt and asphalt modified with 3% (SBS) (Styrene Butadiene Styrene) "Hybrid plastomer and elastomer polymers". To determine the performance grade (PG) of modified asphalt and assess its rheological properties superpave system tests were applied tacking into account short and long term aging while FTIR test was used to study the effect of modifiers on chemical bonding. The results of the study reveal that the PG increased by one degree when 1% of PVC is used but PG increased by two degrees when 3% of PVC and 3% of SBS are added. The results also show that PG increased three degrees when 1% PVC plus 3% SBS are sued while it increased four degrees when 3%PVC plus 3% SBS are sued. This gives an indication that hybrid polymers have significant influence on improving the PG of the modified asphalt as compared with control asphalt binder. From FTIR test results, it is found that the modified asphalt binder had a positive influence on aging process as compared with neat asphalt; therefore, fatigue cracking and rutting of the modified asphalt will be improved.

Paper ID: 085

Performance analysis of the new design of PV/storage solar collector

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Abstract. The purpose of a solar storage collector is the conversion of solar energy into thermal energy, which is stored in the water. In this design, a solar cell was fixed on the inclined metal surface of a rectangular storage collector and acts as a black absorber surface. Two experimental models were constructed to study the performance of the new design. In the first design, which is referred to as PV/storage solar collector, the solar cell was fixed on the inclined metal surface and worked as a black absorber surface in the conventional collector. The second model was the rectangular storage collector, similar to the first model with most attributes. The results showed that the outlet water temperature reaches the maximum value of 42 ^{o}C at 2 p.m. for the PV/storage collector at spring day and the temperature differences between the outlet and inlet temperature are 14.6 ^{o}C and 30 ^{o}C at 2 p.m. for the PV/storage collector and the conventional storage collector respectively. The overall efficiency increases as a result of removing hot water from the collector due to cool the solar cell and increases the electrical energy produced. Generally, under load conditions, the overall efficiency of the PV/storage collector is higher than the second design. In the summer, the highest value for the overall efficiency of the PV/storage collector was 63.02 % under load condition, while the higher value for the overall efficiency was 40.88 % without load condition.

Paper ID: 087

Transient Analysis of Laminated Composite Shallow Shell Under Point and Line Load by using New Higher Order Shear Deformation Theory

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Abstract. Thedynamicresponse isdepending on the new higher order shear deformation function which supported simply by the other hand the cross-ply laminated shallow shell .The amount of the solutions of the new displacement is optimized for giving the closest results to the 3D elasticity which depends of the parameter ‘‘m’’. It is obvious that the obtained transient reactions that Navier series use for both types the thick and thin anti-symmetric as well as the symmetric cross ply laminated shallow shell. The results of the several parameters design as the number of laminates, curvature ratio with the thickness ratio on dynamic reaction of the laminated composite (Glass/epoxy) and hybrid (Glass/carbon/epoxy) shallow shell which are underwent to the center point load and the distributed line with different periods of time dependent loading such as sine pulse, triangular pulse and step pulse are all examined and studied. On the other hand, the accuracy of the present codes by using Matlab R2017b is verified by comparing withAnsys15software.

Paper ID: 088

Evaluation the anticancer activity of Propyl-Cannabinol Allyldimethylsilyl Ether against Different Cancer Cell Lines

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Abstract. Propyl-cannabinol allyldimethylsilyl ether (PCAE) is one of the phytochemical compounds which were isolated from Clausena excavata Burm f. However, the cytotoxicity and selectivity properties of (PCAE) against different cancer cell lines are not elucidated yet. Hence, this study has been done to test the efficiency of (PCAE) as a new anti-cancer agent. Isolation and identification of this compound was conducted by various spectroscopic analyses including electron impact mass spectra (EI-MS), X-ray diffractometry (XRD) and previous data. In vitro, cytotoxicity of compound against different cancer cell lines was investigated by MTT assay. After exposure time, growth inhibition with significant changes in cellular morphology was clearly noticed in treated cells. The HT29 cells were most directed towards apoptosis relative to the other cells, as the result of treatment with Propyl-cannabinol allyldimethylsilyl ether (PCAE). In Conclusion Propyl-cannabinol allyldimethylsilyl ether (PCAE) has been appeared a significant effect in stopping and killing cancer cells.

Paper ID: 089

The Impact of Zinc Oxide Nanoparticles (ZnO-NPs) on the Kidney Structure of Male Albino Mice

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Abstract. According to the distinctive physical and chemical properties, zinc oxide nanoparticles (ZnO-NPs) are widely used in a multitude of applications such as medical diagnosis, preparation of pharmaceutical products anti-sunshine, deliver drugs to target parts in the body and cosmetics. The objective of this study was to investigate the impact of ZnO-NPs on the kidney structure of male albino mice by using intra-peritoneal injection. Animals were injected with 0.1 ml of 150 mg kg-1 of ZnO-NPs (25-45 nm size) for a period of 7 and 14 days. The results showed a decrease in the average body weights of animals after 14 days of injection with ZnO-NPs when compared with control group ($p \leq 0.05$), while, the period of seven days did not caused any alteration in the mice average body weights. A decrease was recorded in the diameter of renal glomerular after 14 days of injection with 150 mg/kg ZnO-NPs, and an increase was recorded in the space of Bowmann's capsule after 7 and 14 days of injection with 150 mg kg-1 ZnO-NPs compared with the control animals ($P \leq 0.05$). The diameter of proximal and distal tubules showed statistically significant increase ($P \leq 0.05$) after injection with 150 mg kg-1 ZnO-NPs for 7 and 14 days compared with control groups. The histological examination revealed injuries in the kidney structure after 7 and 14 days of exposure to ZnO- NPs which were involved accumulation of inflammatory cells close to the blood vessel, sloughing and degeneration of lining epithelium in renal tubule, necrosis, foci of nucleus hypertrophy, congestion of blood vessels, lose and atrophy of glomerulus, intratubular calcium deposition and shrinkage of glomerulus. However, the histopathological changes in the kidney after 14 days of injection were more severe than at day 7. We conclude that ZnO- NPs could have serious kidney structure and functional toxicological impacts.

Paper ID: 090

Thermal Analysis for the Materials of the Hot and Cold Storage Tanks for a Cooling System Operating by Absorption Cycle

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Abstract. This research deals with thermal effect of hot and cold storage materials for a cooling system operating by an absorption cooling cycle of lithium bromide-water with a capacity of 4 tons. The heat needed to operate the system was gain from a solar parabolic concentric collector. It heats the hot tank through which it operates the generator of absorption cycle, which is the first part of the system. The extra heat is stored in hot tank as well as a cold tank is used to store the extra cooling capacity for air-conditioning a certain space of (80 m^2). The best volume for the hot and cold storage tanks has been chosen along with the solar collector used with the appropriate coefficient of performance, which is determined after simulating the absorption cycle. When the system stops working and this occurs when the temperature of the hot tank is less than (65 □), then the cold tank performs air-conditioning process. The hot tank volume has been resized (from 0.55 m3 to 1.4 m3) as well as changed the area of solar collector to give the highest temperature that the hot tank could reach with a variation cooling load, which was calculated hourly by Carrier_HAP420 software during the day. The effect of these coefficients has been studied and analyzed separately by setting the area of solar collector and hot tank capacity and changing the volume of cold tank (from 0.9 m3 to 1.5 m3) that receives the extra cooling capacity. The system has been simulated by simplifying and deriving all related equations of thermal balances for hot and cold tanks, solar collector and cooling system with all its parts. The simulation has been performed to predict the best fluid performance used in both tanks. The glycerin was chosen because its with stands high temperatures in hot tank and the very low temperatures in cold tank. The most appropriate volume for hot storage tank is (0.55 m^3) when the area of solar collector is (11.7 m^2), working to cover (13) hours from 9 a.m. to 10 p.m. The most appropriate volume for cold storage tank is (1.5 m^3), giving (3) working hours from 10 p.m. to 12 a.m.

Paper ID: 091

The Influence of Different Pore Forming Agents on Piezoelectric and Dielectric Properties of Porous PZT-PCN Ceramics

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Abstract. In this study, the researcher developed porous lead zirconate titanate–lead cobalt niobate 0.8Pb(Zr1/2Ti1/2)O3–0.2Pb(Co1/3Nb2/3)O3 (PZT–PCN) piezoelectric ceramics with varying porosity using PVC Stearic Acid (SA) and PMMA as pore forming agents (PFA) by burnable plastic sphere process (BURPS). The study investigated the effect of PFA on the microstructure, dielectric and piezoelectric properties pertaining to porous PZT-PCN ceramics. The density decreased as the content of pore formers increased. This resulted in increasing of the porosity. The values of both longitudinal piezoelectric coefficient (d33) and relative permittivity (Ɛr) were shown to have decreased by increasing the porosity. The results showed that with a density of around 4.4 gm/cm3; it was possible to obtain a hydrostatic of merit (dhgh) value for PZT-PCN reaching 2732×10-15 m2/N. This finding confirms that porous PZT-PCN ceramic is a promising material for biomedical diagnostic devices.

Paper ID: 092

Augmentation of Biomethane Production from Potato Peels Waste by Co-digestion with Sheep Manure

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Abstract. An anaerobic co-digestion process is a pragmatic way to manage the food, agriculture and animal waste that connected with providing the needed energy such as a biomethane that considered one of important type of energy source.This studyfocused on the possibility of using potato peels waste (PPW) as a co-substrate for co-digestion with sheep manure (SM) and inoculated with 10 v/v% of inoculum from rumen fluid in a batch stirred biochemical at mesophilic conditions to producing biomethane. In this investigation different mixing ratio on the base of total solid percentage of the substrates in feedstock PPW:SM 100: 0, 20:80, 40:60, 60:40, 80:20 and 0:100 were tested, the results show, the higher amount of cumulatively producing biogas and biomethane percentage were about 2056 mL and 69 % respectively with mixing ratio 80:20 of PPW: SM. This study presented that PPW is an appropriate feedstock for the co-digestion with SM, which improve the amount of producing biogas moreover the percentage of biomethane that can be used as an alternative source of energy.

Paper ID: 093

Evaluation the Influence of Cesium 137 source on Some Physical Properties and Molecular Weight of Poly Vinyl Acetate at Room Temperature

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Abstract. Radiation influence on some rheological properties of polyvinyl acetate (PVAC) in chloroform solution ($CHCl_3$) was studied. Capsule shape samples of PVAC were irradiated using cesium 137; γ=661.66 Kev and β=513.97 Kev (as a radioactive element) for 10, 20, 30 and 40 minutes. PVAC / chloroform diluted solutions were prepared at room temperature. The results showed that there is a direct relationship between the amount of radiation and viscosities values (shear, relative, specific and reduced). In particular, a pronounced reduction in the viscosities values starts to be observed for a radiation period of 10 min. After that, the increase in viscosities continues with radiation time up to 40 min. Once PVAC was subjected to the gamma radiation, the crosslinking was indorsed with radiation time increasing and reached the highest limit at 40 minutes radiation as shown by the values of the average viscosity molecular weight. The molecular weight of polyvinyl acetate documented highest value which is 37077.07at 40 minutes' period. The investigation in this study confirmed that radiation dose has an effective influence on polymer chemical structure, therefore, its properties are a function of radiation dose.

Paper ID: 094

Performance Improvement for Vane Type Vertical Axis Wind Turbine with Movable Vanes

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Abstract: This paper presents vane type vertical axis wind turbine (VVAWT) aerodynamic performance assessment, which includes movable vanes. Vertical wind turbine with 3-bladed movable vanes with the top and bottom boards is designed using rotor diameter and rotor height of 0.085 m and 0.11 m, respectively. The design increases the torque on the side of the model, which rotates in the direction of the wind, thereby enhancing the drag coefficient C_D and reducing the negative torque on the opposite side of the blade, which revolves against the wind. This mathematical model examines wind power, theoretical powerat turbine shaft and the power coefficient C_P at a range between 4 m / s and 22 m / s at a variety of wind speeds. The results show that the turbine's capacity (1.2 Watt compared with upper and lower vane types) is growing for new wind turbines with good technical properties and can more efficiently be used to generate power at low wind speeds (power coefficient of$C_P = 0.25$) compared to vane models without upper or lower boards.

Paper ID: 095

A New Construction Material Reinforced With Spiral Fiber from Iron Waste

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Abstract. The scope of this investigation is to reinforce of mortar with special fiber form of iron waste. Two groups of mortar were prepared, with and without SBR. Each of these groups of mortar was reinforced with spiral fibers of iron waste. The fiber waste was approximately (3cm) in length and (1cm) in diameter. The fibers were added at different percentages (6, 10, 12%) by weight of sand. These groups were allowed to cure for 28 days. The results show an enhancement of strength for each group after measuring the strengths of compressive and flexural. Moreover the properties (dry density and water absorption) were improved too. The lowest result of dry density and water absorption were (2132.2 Kg/m3, 9.09%) at 6% with SBR and 10% without SBR respectively. The best results of compressive strength and flexural strength were (36.88 MPa, 8.0893 MPa) at 12% without SBR and 12% with SBR respectively. It was concluded that the spiral fibers of iron waste can partially replace the fine aggregate with reinforcing and improving the properties of mortar.

Paper ID: 097

Point Cloud Pre-Processing and Surface Reconstruction Based on 3D Gaussian Curvature Algorithm Technique.

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Abstract. In recent years, a 3D laser scanner has increasing attention as one of the modern technologies to digitizing the 3D object surface in manner to obtain a mathematical representation of object's and surface reconstruction. Due to limitations of a 3D laser scanners, the row point cloud, which are acquired from these techniques, included some undesired information such as noise points and associated huge number of points in point cloud. In the present paper, a new proposed point cloud simplification algorithm for scanned object using 3D laser scanner (Matter and Form) has been adopted in manner to extract the necessary geometric features which represented by a 3D surface curvature. This algorithm based on instantaneous calculation of 3D Gaussian curvature for each data point. The curvature value indicates both quality of the topical calculations and a noise isolating and detection in the point cloud set. A MATLAB environment has been adopted to construct a proposed point cloud simplification algorithm program, this program has been proved using a practically case studies. The results proved the effectiveness of the proposed algorithm in local calculation of 3D curvature and detection and isolate the noise points in point cloud where the percent of data which was ignored as noisy data point were (49.29%) and (57.30%), of total data point number after applying the algorithm for the first and second proposed case studies respectively.

Paper ID: 098

Effect of Ce Addition on Mechanical Properties and Shape Memory Effect of Cu-14%Al- 4.5%Ni Shape Memory Alloy

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Abstract. This investigation examines the influences of the (Ce) addition on the mechanical properties and the shape memory effect (SME) of the Cu-based shape memory alloys (SMAs), in which (Ce) is added in three percentages (0.3, 1.0 and 3%) to the base material (Cu-14%Al-4.5%Ni). Different tests and inspections, including X-ray diffraction, compression, HV hardness, and the thermomechanical tests were conducted on the (Ce-modified) alloys. In addition, a differential scanning calorimetry test, microstructure examination via optical measurements, and (SEM) for the whole alloys were performed. Results revealed an increment in the hardness, the yield strength and the maximum strain (ε max%) occurred with the increase of the (Ce %) in the base shape memory alloy (with exception of the 3% Ce case). The thermomechanical characteristics depicted an increment in the recovery of strain by as much (98.72%) with a reduction in the modulus of elasticity of martensite and an increment in the modulus of elasticity of austenite. Moreover, the temperatures of transformation shifted to beyond the base shape memory alloy domain (100-170ºC), and the modified (SMA) with (3% Ce) exhibited better results than the other materials.

Paper ID: 099

Degradation of Parachlorophenol in Synthetic Wastewater Using Batch Electro-Fenton Process

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Abstract. Batch Electro-Fenton process with carbon felt cathode and mixed metal oxides plate anode has been applied to aqueous solution contains 50 mg/L of parachlorophenol. The effect of four important process parameters, namely, ferrous ions concentration (0.1-1 mM), time (15-120 min), pH (1-5) and current intensity (100-500 mA) on Chemical Oxygen Demand (COD) removal efficiency and energy consumption were investigated. Response Surface Methodology has been performed to design of experiment. Multiple response optimization found that maximum COD removal efficiency of 86.4% with minimum energy consumption of 4.2 kW h/kg COD was achieved at optimum conditions.

Paper ID: 100

Preparation and Simulation of Lead mix-halide Perovskite Solar Cells

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Abstract. The Organic Perovskite Solar Cells (OPSCs) exhibit several distinctive properties of their optoelectronic response. In this paper, OPSCs which have harvesting light of materials, $MAPbIBr_2$ and $MAPbICl_2$, with Cu_2O as hole transport materials (HTM) were synthesized. Optical and structural properties for the peroveskite materials and HTM layers of OPSCs were investigated. Finally, the I-V curves of the OPSCs were measured via integrated cell tester included the I-V Photovoltaic measurements system and the solar simulator system. The Power Conversion Efficiencies (PCE) of OPSCs were (3.22%) and (2.49%) to the devices which have $MAPbIBr_2$ or $MAPbICl_2$ as absorption layers, respectively. Measurements were tested at light Intensity ($100Wm^{-2}$)).

Paper ID: 101

The Influence of PH11.17, and Temperature on Tautomerism Reaction Of Schiff Bases Derived From P-Aminobenzaldehyde with Substituted O, M, P-Hydroxyanilines.

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Abstract. The aims at paper studying the tautomerism reaction in schiff bases derived from para aminobenzaldehyde. with substituted aminophenols (o,m,p) by action of buffer solution at PH11.17 (Tri sodium phosphate) and different temperatures , using U.v spectra. Experimentally, the Schiff bases were prepared by standard methods and confirmed under study the tautomeric equilibrium constants are determined at five different temperature range between (283 - 323)K, Hence, the thermodynamic parameters namely $\otimes\overline{G}, \otimes\overline{H}, \otimes\overline{S}$ are calculated and discussed, finally, all thermodynamic functions determined, support the tautomersim processes in schiff bases under study.

Paper ID: 102

Influence of Eggshell Powder on the Portland Cement Mortar Properties

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Abstract. This research presents an investigation the influence of eggshell powder (ESP) on the performance of Portland cement mortar. Two different eggshell powders states were prepared. These include untreated eggshell powder (UESP) and treated eggshell powder (TESP). The TESP consists the heating of ESP up to 750ºC for one hour in electric furnace. Cement mortar of ordinary Portland cement with (1:3), (cement to sand) ratio, were mixed with each of two ESP states (UESP and TESP) at different percentages ranged of (0 to 20) wt% by the total weight of cement mortar mixture. Water absorption, thermal conductivity, compressive strength and hardness properties are measured for the mortar samples after curing for (28 days). The results generally showed that the addition of ESP to the cement mortar improved its properties. The addition of TESP to mortar mixture gave better properties as compared to UESP addition at the same weight ratio. The water absorption percentage of the samples was decreasing about 30% at addition 15 wt% of TESP. The compressive strength of the mortar was increased by 29% over the control mortar at addition 15 wt% of TESP. The hardness values of mortar are slightly enhanced with increasing ESP ratio, which increased about 2.5% with addition 20 wt% of TESP. The better thermal insulation of mortar samples was obtained from addition of UESP, reaching the rate of reduction in the thermal conductivity to 40 % than control mortar.

Paper ID: 103

Study the Effect of Factors on the Flexural of the Composite Leaf Spring

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Abstract. The modern automobile industry is heading into reducing the weight of vehicles in-order to reduce the fuel consumption of the modern vehicles, for that reason composite materials have gain special position when developing vehicles. This paper studied leaf spring, which is one of car part that can be manufactured from composite material, the material used at this research was E-glass fiber with polyester and epoxy matrices, experimental work showed the relation between load capability and the fiber distribution within the composite, having a better load bearing capability for material made from woven fiber. Additionally, the increase of fiber fraction in composite will improve its mechanical properties. Moreover, the type of matrix used in manufacturing the composite had a significant factor on material stiffness, where the mechanical properties of composite with epoxy matrix improved and increased the weightlifting ability more than a matrix made from polyester.

Paper ID: 104

Characterization of Agriculture Wastes Based Activated Carbon for Removal of Hydrogen Sulfide from Petroleum Refinery Waste Water

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Abstract. Hydrogen sulfide (H_2S) (aq) is one of the most toxic pollutants in petroleum refinery waste water. It is very harmful to human health and causes environmental and economic problems. The removal of H_2S (aq) from a simulated petroleum refinery waste water using activated carbons produced from agricultural by-product such as, coconut shell (CNS), palm kernel shell (PKS), and wood sawdust (WSD) were investigated. The activated carbons obtained from the CNS, PKS, and WSD were chemically activated using KOH. The prepared ACs was characterized using SEM/EDX, FTIR, BET, and TGA. Comparative studies between all the three adsorbents for the removal of H_2S (aq) from the simulated waste water were carried out. The adsorption studies revealed that modified PKS-based activated carbon (ACPKS) has shown best performance for the removal of H_2S (aq). It can be concluded that ACPKS has an effective adsorbent for the removal of H_2S (aq) from simulated waste water.

Paper ID: 105

Effect of Thermal and Laser Treatment on the Hardness and Strength of Sermite Coating Adhesion with Thermal Spraying Technology

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Use North Refineries Company, Baiji Salahaldeen- Ministry of Oil- Iraq

Abstract. The enormous impact of corrosion on the daily operations and throughput of many industrial establishment has been a point of concern in recent years. In this study the ceramic coating consisting of a mixture of Al2O3) and (Al-Ni) were applied on oil pipes where Al-Ni was stable at 50%, Al2O3 at 40%, and MgO at 10%., The mixture was sprayed on a 316 L steel base using a flame thermal spraying device at different spraying distances of8,12,16, and 20 cm. The thermal and laser treatments was conducted on the coating layer and microscopic images were subsequently taken. The results obtained clearly revealed the best thermal treatment of 1000 □ for 1.5 h, spraying distance of 12 cm, and laser energy of 500 mJ. Thus, the mechanical properties of the microscopic coating layer were greatly improved.

Paper ID: 106

Enhancement Efficiency of Poly (o-toluidine) :ZnO Solar Cells by Using Metal Oxide-Assisted poly(styrenesulfonate):poly(o-toluidine): poly(3,4ethylenedioxythiophene Nanostructures

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Abstract. In this paper, we present the fabrication and the photo-physical characterization of a photovoltaic solar cell in the presence of Iron (III) oxide nanoparticles (Fe_2O_3 NPs). This latter is deposited at the hole's interface collecting the layer of buffer [poly(styrenesulfonate) :poly (o-toluidine) and poly (3,4 ethylenedioxythiophene) :(PEDOT: PSS)] and (POT) Zinc Oxide Nanoparticle (ZnONPs) active layer. This additive at the interface was noticed to considerably elevate the performances of the solar cell. These devices' photo-physical characteristics are examined at the interface of POT: ZnONPs active layer and PEDOT: PSS buffer layer with Fe_2O_3 NPs with varied space distributions. The enhancement in optical characteristics occurs when the Fe_2O_3 NPs are appropriatley large to break through the active layer and subsequently improving the photovoltaic solar cells (PSCs) performances through hole collection efficiency gains. The hybrid PSCs considerably increases the power conversion efficiency (PCE) to 0.18% compared to 0.16% in conventional pure solar cells.

Paper ID: 107

Effect of Single Point Incremental Forming Parameters on Spring Back and Micro-crack density

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Abstract. In this paper Single Point Incremental Forming (SPIF) process was applied without using a dedicated die depending on Iso-planar tool path. The aim of this work is to study the effect of forming parameters (incremental step size, product angle and tool rotational speed) on the spring back of wall angle and micro crack density of truncated cone made from low carbon steel workpiece (1008-AISI). The Box-Behnken design of experiment was used in this study. The results show that the incremental step size has the great significant on wall angle spring back among the other parameters and the wall angle of product was the great significant on micro crack density. The contribution percent of (incremental step size, rotational speed and wall angle) on spring back were (33.81, 30.11 and 20.46) % respectively and on micro crack density were (21.99, 15.19 and 40.64) % respectively.

Paper ID: 108

Use of palm oil fuel ash (POFA)-stabilizedSarawak peat composite for road subbase

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Abstract. Peat land covers a large portion of the total land area in Malaysia and several other countries throughout the world. The Malaysian state of Sarawak has the most peat land area nationally. Peat is considered a problematic type of soil due to its high compressibility, high moisture content, high organic matter and low shear strength. As a form of stabilization, it is suggested to combine palm oil fuel ash (POFA) with peat. This study investigated the engineering properties of these matrices in terms of the California Bearing Ratio (CBR) and Standard Proctor test values. Results showed that the dry density of the peat samples increased with the increase in POFA content. The POFA-peat combinations showed an increase of 4 times the untreated peat value. Also, CBR values for these combinations increased from 31- 42 fold, in comparison with untreated peat. The peat-POFA CBR values are rated as good materials for the purpose of road base or subbase construction.

Paper ID: 109

Application of Box Behnken Design to Optimize the Parameters for Kenaf-Polypropylene for Sound Absorber

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Abstract. This journal discusses the use of Box Behnken Design (BBD) approach as Design of Experiment (DOE) to plan experiments to find the Sound Absorption Coefficient (SAC) for Kenaf/Polypropylene (PP) sandwich sample with an overall objective of optimizing the density, thickness, pressure, and frequency of sound. The first objective of this study is to identify the significant factors of composition mixture of Kenaf Fiber and PP to get optimum SAC. From the results of the Analysis of Variance (ANOVA), all four parameters selected were significantly affected the SAC with the *p*-value <0.0001 and R^2, Adjusted R^2 and Predicted R^2 value more than 0.98.The secondary objectives of the research to compare the SAC between the simulation result and the experimental result based on the suggested test sample by the Response Surface Method (RSM) and tested in an impedance test tube. From the results shown the average of the residuals value for Kenaf fiber with PP is -0.003795 and the SAC value from the simulation result is compatible with the experimental result. On the other hand, the highest SAC for the Kenaf fiber with PP obtained was 0.855 with 0.25g/cm^3 of density, 30mm of thickness, 3000kg pressure, and 5000Hz frequency. While for the lowest SAC for the Kenaf fiber with PP obtained was 0.114 with 0.65g/cm^3 of density, 30mm of thickness, 3000kg pressure and 125Hz frequency. The third objective is to develop an empirical equation for the SAC by using density, thickness, compression pressure and frequency of sound as significant factors. The SAC Equation = 0.345495 - (0.482917 X Density) + (0.001967 X Thickness) + (0.00000379167 X Pressure) + (0.000112 X Frequency) can be used. This SAC empirical equation is valid for the density value between 0.25g/cm^3 until 0.65g/cm^3, the thickness between 10mm until 50mm, the pressure value between 1000kg until 5000kg and the frequency between 125Hz until 5000Hz. The number of experiments conducted in this study was much lesser compared to other designs. The proposed BBD requires 24 runs of experiments for data acquisition and modeling the response surface. A regression model was developed and its adequacy was verified to predict the output values at nearly all conditions. The model was validated by ANOVA before experiments on 24 sets of the sample were performed. The output parameters measured through experiments (actual) were in good match with the predicted (simulation) values using the model developed by BBD. This research is significant because it produced a minimum number of experiments, a validated empirical equation model and conducted an optimized test. As a conclusion, the SAC output and equation generated from RSM is a reliable, valid and compatible with the experimental result with minimum residuals.

Paper ID: 110

Study the Drug Release for Gabapentin Drug Loaded On Natural Polymer

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Abstract. In this work, chitin has been extracted from (Crabs shells) local sources in Iraq. The obtained chitin was converted into chitosan by steeping into solutions of NaOH, then the alkali chitin was heated which reduced the time of deacetylation .The obtained chitin and chitosan were characterized by spectral analysis, chemical grafting of the used Gabapentin on chitosan where carried. For drug (Gabapentin), they were loaded on chitosan using glutraldehyde between the drug and the polymer to form the loaded drug on non-toxic and natural biodegradable polymer chitosan, where characterized by spectral analysis. The effect of different pH on the rate of drug release was studied, which showed that different pH value (pH = 1.2, 7.2, 9.4) have significant effect on the rate of the drug from the loaded polymer chitosan showed highest release at the studied (PH 9.4).

Paper ID: 111

Multi Bands Metamaterial Absorber Optimized by Genetic Algorithm in Microwave Regime

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Abstract. This article demonstrates a metamaterial-based two square rings resonator perfect electromagnetic absorber by using genetic algorithm for multi-band microwave applications such as radar cross sections, bolometer, energy harvesting, thermal detection, and airborne applications. The unit cell incorporates two split square ring resonators. A parametric optimization has been carried out by genetic algorithm in order to obtain six absorption peaks. Therefore, the combination of two square split ring resonators presents six perfect absorption (i.e. highest absorption level) of 96.4%, 99.31%, 94.4%, 91.1%, 99.4% and 95.2% at resonance frequency 13.3 GHz, 14.6 GHz, 16.1 GHz, 17.2 GHz, 17.84 GHz and 18.33 GHz respectively. The proposed structure works due to metamaterial resonance mechanism based on SRR resonator and zero-level-reflection absorption mechanisms to provide multi absorption bandwidth. Our design is of individual benefit to improve devices which need multi-band absorption.

Paper ID: 112

Utility of Curing by Pressure Vessel to Improve Cementations Mixtures

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Abstract. Over the last years, the method of autoclave steam curing was the most effective way to improve the mechanical properties of concrete. Since this mechanism required high energy for efficient curing, the method of compressed air curing was designed.This study is investigated the effect of compressed air technique on the properties of cement mortar. The use of compressed air curing technology in the curing of cement mortar (fresh) is done by placing the cement mortar specimens in the newly created machine specially designed for this purpose and then applied pressure gradually on the specimens until the desired pressure level. The specimens should be kept inside the vessel under pressure for certain periods until maturity. The concrete is final to be de-molded and then placed in water at laboratory temperature. Then the mechanical tests for the specimens are conducted at specific ages. The improvement in properties was observed, where there was the development in the density and compressive strength of hardened cement mortar. This development is attributed to the effect of pressure on the size of air voids within the specimens. The air pressure on the cement mortar in the fresh state (before final setting) causes a significant decrease in the size of the air voids inside the model and causes an increase in the compact of the specimens. Three waiting times were studied before putting the specimens inside the pressure vessel (Three, four and five hours), after casting cement mortar directly and the optimal age was selected for the treatment. Three durations were tested for applying the pressure on the specimens inside the vessel (24 hours, 96 hours and 168 hours). The specimens were then removed and kept in water for tolerate time (144 hours, 72 hours, 0 hours).After the completion of the mechanical tests and comparing the results with the reference mix, it was found that the best age to start treatment is 4 hours (where the age of 3 hours was difficult to control the models because it did not harden enough), and that the best duration of curing was 168 hours where gave an increase percentage of 87. 95% at the age of 7 days and an increase rate of 79.81% at the age of 28 days after shedding the value of pressure (0.5 MPa). The tests showed a clear increase in mechanical properties of cement mortar, which encourages the use of this new and low-cost technology in precast concrete plant.

Paper ID: 113

Recovery of Heavy and Radioactive Elements from Iraqi Phosphate Ore.

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Abstract. In this study, three processes were used to remove heavy and radioactive elements from the phosphate rocks obtained from Qaim fertilizer complex in Anbar Governorate. In the leaching process, hydrochloric acid reacted with the phosphate rocks and liquid solution loaded with dissolved metal ions was obtained. The extraction process of heavy and radioactive elements from the canter of hydrochloric acid with butyl triphosphate (TBP) was investigated in kerosene. Separation of heavy and radioactive elements from butyl triphosphate (TBP) in kerosene organic media using Na_2CO_3. In each process, some variables were used to study their effect on the removal of heavy and radioactive elements such as hydrochloric acid concentration, solid to liquid ratio, temperature, stirring speed, contact time, dilution agents, TBP concentration, A\O ratio, and Na_2CO_3 concentration.

Paper ID: 114

A Comparison Study between Archimedes Spiral Turbine and Propeller Turbine with Wind Attack Angle Effect

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Abstract. A small-scale of wind turbine model has been designed and fabricated by using Fused Deposition Modeling, FDM Nylon material to investigate its performance. The wind attack angle effect on the generated electricity at Archimedes spiral wind turbine, ASWT, and propeller wind turbine was investigated experimentally. Experimental tests were carried out in the open stream field at different wind attack angles and speeds vary from 0° to 30° and from 6.0 to 10 m/s, respectively. The effects of the upcoming flow on the mechanical power extracted by the rotors and electrical power generation were estimated. Both rotors demonstrated growing in the output power, power coefficient, *Cp*, and electricity generation when the velocity of the upcoming flow increases from 6.0 to 10 m/s. The present study shows the results of output power and *Cp* of the spiral turbine is greater than the propeller turbine for all upcoming flow velocities. It was found that ASWT more efficient than the propeller wind turbine for generating electricity.

Paper ID: 116

Artificial Sweetener (Saccharine) As Electrical Properties Promoter for Graphene Oxide and Grapheme

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Abstract. Two novel carbon nanostructures; graphene oxide- (GO) and graphene- (G) functionalized saccharine were synthesized and characterized with a view to study the electrical properties of GO and G in the presence and absence of saccharine. Saccharine was mainly covalently linked to graphene oxide nanostructure with formation of amide bond to afford GO-Sac, while it was physically linked to graphene nanosheets with formation of G-Sac. These two saccharine nano derivatives were characterized using FT-IR, XRD, AFM and SEM. Herein, saccharine not only used for enhancing the electrical properties of GO or G but it was played a main role in increasing of the distance between graphene and graphene oxide sheets, and consequently prevent the agglomeration effect on graphene oxide and graphene sheets. The electrical properties of these materials were measured using inductance, capacitance, and resistance measurements (LCR). The results of LCR showed that the saccharine is able to increase the electrical properties of both two carbon nanostructures with enhance their electrical storage.

Paper ID: 117

Prepration and Characterization of Electrical Properties of Graphene Oxide (Go)/Epoxy Composites

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Abstract. The (GO)/ epoxy composite it was fabricated at different contents of graphene oxide. The GO contents (1.5vol% to 6vol %) has been add to epoxy. The composite was prepared at (25°C). The electrical where is used for determine and measuring the conductivity behavior of composite. The experimental bases of this research clearly show the existence that the conductivity of electric have undergone achievement. During the results of (SEM) images test was clearly shown the interface between the composite compositions.

Paper ID: 118

Nanofluid Heat Transfer Augmentation in a Double pipe Heat Exchanger

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Abstract. In this study, the heat transfer coefficient and pressure drop in a tube under turbulent flow condition are studied numerically. The Reynolds number range and nanoparticles concentration are in the range of (5000-30000) and 1% to 4% respectively. The governing equations have solved by the finite volume method adopting ANSYS software for simulation. The boundary conditions include the inlet velocity, outlet pressure and constant inlet temperature with adopting SIMPLE algorithm. The results demonstrate that the AL2O3/Water nanofluid can enhance thermal properties of base fluid to 20%, additionally; the heat transfer rate of nanofluid compared to the water is higher but friction factor slightly higher than that of pure water.

Paper ID: 119

Mechanical Properties and Characterization of Epoxy Composite Reinforced with Tungsten Trioxide Nanoparticles

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Abstract. Tungsten Trioxide nanoparticles with different weight fraction filled epoxy composites were fabricated to investigate their effect on mechanical properties. The test was conducted at room temperature and the results show an improvement in the mechanical properties of the reinforced epoxy matrix compared to the pure epoxy resin. Flexural modulus increased with increasing Nano filler content up to 2 wt% then decreased. Hardness increased with increase the range of filler content (1-3)wt%. Impact strength and fracture toughness increased with increasing filler content. Nano crystalline structure of the commercial WO_3 was confirmed using Powder X-Ray diffraction analyser.

Paper ID: 120

Preparation of Graphene Nano-Sheets From Graphite Flakes Via Milling-Ultrasonication- Promoted Process

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Abstract. Graphene is the new wonder material that known as an atomic layer of graphite .Because of its exceptional mechanical, electrical, thermal, optical and biological properties, it's used in different fields such as composites, medical, electronic, energy conversion, and for storage applications. So, preparation of graphene with high quality, low cost, large quantities became an important matter. In our study, planetary ball milling process was used and modified to produce graphene from graphite flakes which used as started material, preceded by annealing and sonication process that used as assistant factors to increase the cleavage and exfoliation rate on graphite structure. Morphological and structural characteristics using a range of instrumental analysis technique. The results showed that the used graphite were investigated flakes was converted to high-quality graphene nano-sheets.

Paper ID: 121

The influence of the sliding time on the Dry Sliding Tribological Behavior of the Bearing Made of the Brass alloy C93700 Bearing Bronze

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Abstract. The present work studied experientially the influence of the sliding speed SS, sliding time ST and radial load RL on temperature rise on a bearing that made of brass alloy C93700 Bearing Bronze sliding against a stainless steel shaft. For this experimental study, a specific custom tribometer was developed and experiments were carried out under an actual external load of (1073.3 and 2073.99) N, sliding speed (250, 500 and 750) rpm. Results showed that the average temperature is increased withthe increase of the sliding time. It was increased from 25^{o}C to be 41^{o}C depending on the values of the sliding speed and load. It was found that the effect of the load is greater than the sliding speed on temperature rise. The experiments covered two period, transient and steady state periods. It was also observed that the coefficient of frication COF increases with the sliding increase of the time ST for all average external radial load values and sliding speed SS. The friction coefficient will then continue decreasing till stability

Paper ID: 122

Study the Optical and Morphology Properties of Zinc Oxide Nanoparticles

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Abstract. In this research, the zinc oxide nanoparticles powder (ZnO-NPs) was dissolved in ethanol by using a magnetic stirrer device .The ZnO -nanoparticles properties were studied by several techniques, such as X-ray analysis,X-ray fluorescence, Fourier transform infrared spectroscopy, atomic force microscopy, transmission electron microscopy, scanning electron microscopy and UV-vis optical absorption . XRD patterns show that hexagonal cell for ZnO-NPs. XRF analysis showed a high purity for ZnO-NPs.AFM, TEM and SEM images appear the particle size and the morphology for ZnO-NPs.The spectrum UV-vis shows that optical band absorption located in 377nm for ZnO-NPs.Zinc oxide can be considered an important element because of its use in many fields such as medical application, electronic industry, sun screening agent, cosmetics, UV protection, electrodes for solar cells and piezoelectric.

Paper ID: 124

Effect of Static and Dynamic Loadings on Unsaturated Soil Slope Stability

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Abstract. The objective of this study is to find the effect of dynamic loads on slope stability. The parameters studied in this research are horizontal displacement of vibration, frequency, suction values and the form of slope failure. A laboratory model was manufactured in the form of a box with dimensions of (2000 X 1000 X 1450)mm that slides on a rail installed on the ground and moved by a dynamically generated system. To explain the effect of dynamic load. Three dynamic tests were performed. The one direction horizontal vibration displacement of the first, second and third tests are (10, 20 and 40)mm respectively. Dynamic conditions were applied as a horizontal vibration at frequencies of (0.5, 1.0 and 2.0)Hz. The time duration for each frequency value is (3)minutes. The acceleration during vibrations was measured during the test with an accelerometer that was placed inside the soil and on the shaking table. The main results showed that the dynamic load was negatively affected in its slope bearing capacity. It decreased from (408)kPa at the static test to (382.6, 306, 280.6 kPa) at the three dynamic tests, respectively. On the other hand, the measured amount of initial negative pore water pressure (suction) of the layers (upper, middle and lower) was found to be (25,23,and21) kPa respectively. Results also showed that the suction values were slightly changed during the tests. The experimental results were compared with that obtained from numerical simulation using Geo Studio software. Experimental results are nearly identical to that obtained from numerical analyses.

Paper ID: 125

Impacts of Materials on the Intensity of Uniform Static Magnetic Fields using a Multi Helmholtz Coils Design

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Abstract. Impacts of different materials (cartoon, PVC, wood, plastic, iron, glass, and Mild steel)) on the intensity of a uniform static magnetic fields (SMF) proved through designing a multi Helmholtz coil connected in series. The design provided a magnetic field ~ 4 mT depended on applied currents and the distance between the coils, also it has provides an area of 25 cm square with a constant magnetic field of 3.1 mT. The results indicated that the materials of cartoon, PVC, wood, plastic, and glass has no significant impacts on exposed magnetic field (lossless of SMF). However, materials of iron and Mild steel were in a significant (~0.66) mT and highly significant (~2.3) mT impacts on SMF, respectively.

Paper ID: 126

Effect of Adding Nanoparticles from Zirconia or Alumina on Some Mechanical Properties of the Ternary Polymer Blend

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Abstract. Due to the importance of polypropylene and its use in wide applications, So, in this research will be study effect of adding two types of nanoparticles (Zirconia and Alumina) as reinforcing materials with different percentages of weight are (0.3%, 0.5%, 0.7%) to improve mechanical properties of the ternary polymer blend which based on polypropylene material, according to the proportions of the components ((94%PP: 1%(PP-g-MA): 5%UHMWPE): X% (ZrO_2 or Al_2O_3)), were prepared by melting technique using double screw extruder. Moreover, in this research to improve adhesive force and increase compatibility between reinforcing nanoparticles materials and with polymeric blend components, it was used polypropylene grafted malic anhydrated with ratio 1% (PP-g-MA). The results illustrated that the effect of adding 0.3% ratio of ZrO_2 nanoparticles to the ternary polymer blend was gave better mechanical properties (tensile strength, impact strength, fracture toughness) compared with adding of the Al_2O_3 with the same ratios and to the same group of the ternary polymer blend, and the As well as, that it was observed that the maximum values of these properties arrived to 32.25 MPa, 41 kJ/m^2, 7.69 MPa$\sqrt{m}$, respectively.

Paper ID: 127

Determination of the optical Parameter from Chitosan doping with Nicotine

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Abstract The aim of this work is recycling where the natural polymers were extraction (Chitosan) from Shrimp Waste (soluble in acetic acid), and Nicotine extraction from in cigarettes. measurement FT-IR (400-4000) of Chitosan and Nicotine(CN) and analysis of active group were taken to ensure the purity of extracted materials. The chitosan/Nicotine as also revealed by scanning electron microscopy (SEM). Measurement UV –Spectroscopy rang (300-900) nm and The UV-IS optical properties related to, refractive index (n), extinction coefficient (K) and was the real dielectric constant (εr), and fixed fantasy insulation (εi).

Paper ID: 128

Study of the Resistance of Metal to Plastic Deformation of Steel Pipe in a Wide Range of Temperature Variation

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Abstract. The article is dedicated to the research of a regular pattern of the change of metal plastic deformation following deformation stress elimination. The peculiarity of the research is that it was performed with a single method for an entire temperature range: from room temperature value to values close to the melting temperature. For the first time the fact of metal softening at temperatures close to 600^0C was discovered. Physical explanation of the phenomenon is provided within the article. It must be emphasized that this result can be applied during determination of technological parameters of pipe calibration and straightening in thermal departments of pipe-rolling workshops.

Paper ID: 129

Elaboration of a Digital Model for Estimation of Power Parameters of a Rolling Process in a Continuous Rolling Mill

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Abstract: Development of pipe rolling industry led to a wide application of continuous rolling mills with a retained mandrel and 3-roll calibres for billets rolling. It required refinement of a number of theoretical provisions, related to kinematics change of the process. Within the framework of this research, a methodology for determination the process power parameters was developed, based on the energy theory. An experimental research was performed with the purpose of finding a pattern of influence of rolling process parameters to the angle of contact of a mandrel and the value of roll widening. Values of average pressure at the point of contact with working mills and a mandrel were determined during the formation of the equation of powers projection on the longitudinal axis. Developed mathematical models and the estimation algorithm of power parameters of a rolling process in a continuous rolling mill allowed the researchers to determine the pipe rolling force in a continuous rolling mill with a quiet high precision. Acquired patterns might be applied both in research and in the development of rolling data tables for pipe-rolling units with continuous rolling mills.

Paper ID: 130

Mechanical Properties of Recycled Plastic Waste with the Polyester

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Abstract.In this paper, nylon waste from PET and HDPE were used after its' cutting in different forms (fibers and particles) and then mixed with polyester. The mechanical properties (tensile and compression) were studied. It is found that when adding the nylon waste to polyester, the stress that the material can bear is reduced. In contrast the strain increased in most tests, and thus can be used in many applications and on the other hand is considered it an important way for waste disposal a safety way and harmless to the environment and useful at the same time.

Paper ID: 131

Amino Acid Salt Promoted Aqueous Potassium Carbonate Solution for Carbon Dioxide Absorption from Flue Gas

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Abstract. Increasing carbon dioxide emissions in the environment is a universal matter that needs a decisive resolve so as to moderate the developing risk of climate alter. Numerous studies have been conducted over the closing few decades to fathom this issue. In the this study, aqueous potassium carbonate (K_2CO_3) solution promoted by amino acid salts were applied for absorbing carbon dioxide from gas mixture in a packed column. The experiments were achieved at atmospheric pressure and working temperature of 298 K using mixed gas consists of 15 vol.% of carbon dioxide and 85vol.% nitrogen gas. While, the experiments of desorption were conducted at working temperature of 363 K.The absorption performance of 30 wt% (1M) K_2CO_3 solution after adding 10 vol.% of different amino acid salts solution [Glutamine salt (Gln_s), Glutamic acid salt (Glu_s), Tryptophan salt (Trp_s), Methionine salt (Met_s) and Tyrosine salt (Tyr_s)] was evaluated. It was found that adding amino acid salts solution as promoter to K_2CO_3solution increases the absorption rate and enhances all other solvent properties.

Paper ID: 132

Novel pioneered approach in understanding the gathering between Atomic Force Microscopy with Flow Injection Analysis. Study at various steps in precipitation reaction methodology

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[*]*Department of chemistry, College of science, University of Baghdad, Baghdad, Iraq*

Abstract: An attempt was made to explain how the Atomic force Microscopy (AFM) being a very effective good guide of studying and comparison topography and morphography of any kind of surfaces that might be obtained during various steps in precipitation reaction methodology. Concentration was made on using a novel method for determining Mefemanic acid, Indomethacin and Ibuprofen drugs by reaction with different precipitating agents (8-HQ, $S_2O_8^{2-}$, PTA, $K_3[Fe(CN)_6]$, K_2CrO_4, and SNP). No previous study what so ever were carried out using both techniques as this is regarded a pioneer methodology using ISNAG-fluorimeter and the extension of the use with FIA.

Paper ID: 133

Novel Approach of Junction Cell For on – Line Fast Chemiluminescence Reaction and Light Energy Transfer by 8 mm Optical Fibers

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Chemistry Department-College of Science U.O.B - Al-Jadriyah- Baghdad -Iraq.

Abstract. Folic acid was determined by a new , accurate , sensitive and rapid indirect methodthrough an adduct derivative formation of folic acid via continuous mode of FIA coupled with a homemade of a new design of Chemiluminescence cell for measurement of the chemiluminescence signal that results from the reaction of luminol molecule in alkaline medium with folic acid to produce of an adduct derivative of luminol-folic acid . Under the optimum established conditions, the linear range of 0.0001-0.14 mmol L^{-1} along with correlation coefficient (r) of 0.9967, Limit of detection (LOD). (S/N =3) 1.545 ng / 70 µL were achieved .Precision expressed as relative standard deviation for eight replicates measurements using 0.1 mmol.L^{-1} folic acid ; less than 1% were obtained for folic acid . The newly developed methodology was successfully applied for the estimation of folic acid in two drugs of different companies. The comparison that was made between two methods by the use of standard addition method and applied: individual t-Test and paired t-Test. It shows, there was no differences between the claimed values of each difference individual company with $t_{calculated}$ -value at 95 %, confidence level. In addition to there were no significant differences between the two methods.

Paper ID: 135

Improving Quality of Image Vision Using Aspherical Polysulfones Contact Lens

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Abstract. Purpose: To study the effect of the presence of aspherical contact lenses made of polysulfones (PSU) on the distortion of the eye image as a result of the increased Entrance pupil diameter (E.P.D.). Methods: aspherical contact lens (CL) made of polysulfones (PSU) is investigated. Retinal image quality is analyzed numerically based on Liou and Brennan's eye model. Chromatic and polychromatic light effects on the image are studied. Modulation Transfer function (MTF) was used as criteria to analysis the vision quality. Results: The results indicate that the image MTF is sensitive to (E.P.D.). Moreover, eye vision degrades as (E.P.D.) increases due to increased spherical and chromatic aberrations. The use of aspherical PSU-CL substantially improves vision quality. The degradation caused by pupil size is reduced, thereby improving the performance of the eye, specifically for polychromatic. Conclusion: Eye vision can be improved by using PSU polymer contact lens (high refractive index (n=1.6) and abbe number=23). In addition, aspherical contact lens introduces another degree of freedom (conic parameter) used to improve the vision quality.

Paper ID: 136

Effect of Dual Impeller Type on Flow Behavior in Fully Baffled Mixing Tank

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Abstract. A case of fully baffled standard configuration stirred mixing tank agitated with two types of dual impellers is considered. The geometry of the vessel and other operating parameters are taken as standard operations. The mixing system consist of flat bottom cylindrical vessel which has diameter DT= 0.24m and liquid height equals to tank diameter H=DT. Stirred mixing tank contain four flat baffles which having width Wb=0.024m are spaced equally around the vessel. The characteristics of the flow in stirred tank are studied with two types of impellers, Pitched Blade impeller type and Paddle impeller type. Dual impeller mixer mounted on the same axis shaft with rotating speed at 85 rpm and Reynold number 5937.083 for each type of impeller.The impeller diameter is DI=0.08m. The height (clearance) between the flat bottom of tank and the impeller position is C = 0.08m and the distance between impellers are S = 0.08m. The working fluid is water. In this work to investigate the effect of dual different impellers types on velocity field in mixing tank, a numerical CFD FLUENT developed. ANSYS FLUENT version 15.4 is used to solve continuity equation and momentum equation combined the RNGk-ε turbulent pattern with the standard wall task available in ANSYSFLUENT. The multiple - frame of the reference (MFR) is utilized in this modeling. The computational results confirm that utilizing multi impellers in agitated systems are necessary to minimize the weaken zones in stirred vessel.

Paper ID:137

Sustainability Achieved by Using Voided Slab System

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Abstract. Usage of concrete increases day by day with rapid growth of construction industries. Generally, in any structure, the slab represent the most important member that make a space. Besides, the weight of the slab is approximately 90% of the total weight of the structure. That's mean the slab is the largest member that consuming concrete. So an attempt has been made to reduce the weight of slab by providing plastic spherical voids in two way reinforced concrete slab without compromising with strength and safety, this system is called BubbleDeck system. The use of BubbleDecks has a green effect on environment due to the use of reduced amount of concrete. This research presents a study on 24 slab specimens of different dimensions with different variables. It was concluded that the BubbleDeck slab has a saving on the concrete consumption. That's mean a considerable amount of raw martials (cement, sand and gravel) can be saved. So, the amount of CO_2 emission and energy consumption reduced. Besides, when the diameter of the bubble increased, the amount of concrete reduced and as a result CO_2 emission and energy consumption reduced. While by using high strength concrete, the percentage of cement increased and that's lead to increase CO_2 emission.

Paper ID: 139

In silico Detection of DNA Methylation in Fungi *Neurospora crassa* Genes, *rid-1* and *dim-2*

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Abstract. *Neurospora crassa* is a typical organism for many genetics study, DNA methylation is one of the most important process in DNA sequences which control the gene expression without changing DNA sequences. The *Neurospora* have a two genes *dim-2* which is required for all known DNA methylation and *rid-1* which is defeat any change in sequences. In silico program was used to analysis *Neurospora* DNA by designed two types of PCR primer, first set is for detection each gene and second set for detection CpG Island in two types methylated and unmethylated primer. As well as using selective sensitive methylation restriction enzyme by draw an enzyme map by using Snapgene program tool.

Paper ID: 140

Biomaterial Composition of the Microalga *Coelastrella* sp. (MH923012): Effect of Carbon Source

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Abstract. The effect of carbon source on the internal organic composition (lipids, proteins, carbohydrate, saturated and unsaturated fatty acids) of microalga *Coelastrella* sp. (MH923012) was addressed in the present study. Five to twenty five milliliter (increment 5 ml) of aqueous carbon source were dosing into two groups of cultivation flasks (unadjusted pH flasks group and adjusted pH flasks group). The results demonstrated that the improvement in the specific growth rate depends on dosing times of the carbonic solution added into the cultivation flasks. Furthermore, the balanced organic structure of the cell is affected by the amount of carbonate source available in the culture. For instance, dosing (25 ml) of aqueous carbon dioxide solution has led to product (20.3%) of lipids, (41.5 %) of proteins, and (30.1 %) of carbohydrate compared with the control flasks composition (14.2 % of lipids, 27.7 % of proteins, and 50.7% of carbohydrate). The experimental data also showed a significant increase in saturated and unsaturated fatty acids if the dosing were increased. In addition to that, adjusting the pH did not have a great impact on the rate of specific growth, but the internal organic composition of cells has been affected by that adjustment. Therefore, the current study emphasizes the importance of adopting the carbon source as an important factor in the productivity and selectivity bioprocesses in microalgae cells

Paper ID: 142

The Influence of Wood Ash on Different Cement Mortar Mixes

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Abstract. The effect of fixed amount of wood ash on the different mortar mixes with other materials and their influence on fresh or hardened concrete mortar properties has been studied. The preparation of Ash become by burn the wood in 200 °C, so this process is called as "Wood Ash (WA)", fumed silica (FS) which is commercial material having Nano particles size with water soluble material, fly ash (FA) and quartz sand (QS) were used in different mortar mixes. The mortar strength and fresh properties are increased by adding the wood Ash. The compressive strength was increased by comparing it with the controls mortars mixes. Woods ashes work as fly ash or fumed silica due to the shape of the particles size after burning and grinding it to ultra-fine particles

Paper ID: 144

The Inhibitory Effect of Silver Nanoparticles on Someespecially Bacteria Microorganisms, Pesudomonas Aeruginosa, Esherichia Coli and Staphylococcus Aureus

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Abstract. The study included laboratory experiment to locate the particle size of the nanoparticles and the proportions. Also, the test of nanoparticles nitrate has been appeared to inhibit the increase of positive microbes positive gram, for example, Staphylococcus aureus (S. aureus), two kinds of Pseudomonas aeruginosa and Escherichia coli (E. coli) outside the in vivo experiment. According to the McFarland route the lowest inhibitory concentration of S. aureus. The Pseudomonas aerogenosa is 40 (µg/ml) while E. coli is 50 (µg/ml). The diameters are (20, 35, and 45) for E. coli, Pseudomonas aerogenosa and Staphylococcus aureus, respectively.

Paper ID: 145

Investigation the Doping Influence on the Characteristics of Optical Fiber for Radiation Dosimeter Applications

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Abstract. The influence of doping the single mode fiber cladding and core with germanium (Ge) and phosphorus (P) on the optical properties of fiber had been investigated in this work. This is done using the Finite Elements Method through the COMSOL Multiphysics simulation program. This study will be very helpful for designing optical fiber radiation sensors (Dosimeters) to investigate the influence of different -doping on the fiber sensitivity under different radiations like X-ray, pulsed X-ray, and Gamma-ray pulsed X-ray radiation.

Paper ID: 146

Effect of Acids, Salts and water on Natural Composite Materials

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Abstract: The focus of this study was to study the effect of Aceic acid (CH3COOH), salt solution (Nacl) and water on pure polyester and natural composite materials. Three samples were used, the first consisted of pure polyester, sawdust-polyster and peels walnut-polyster. The samples were immersed in acid, salt and water for 3 and 6 days and then that studiedthe mechanical properties of the materials (compersion stress and hardness) before and after Immersion of samples. It was observed that Compression stress decreased for all samples with different rates after immersion of the samples in each of the acid, salt and water and the effect of acid was the strongest. As for the hardness test, it was found that when the samples were immersed in the salt the value of hardness improved ,While the hardness values of the samples that were in acid and water decreased very slightly

Paper ID: 148

Fabrication of Ni- MWCNTs Nanocomposite Coating by Electroless Deposition Technique

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Abstract:this work aim to prepare Ni-based nanocomposite coating by electroless deposition method onto stainless steel (316L), where this coating technique represents an alternative technique to obtain coatings on the various substrates. However, the effect of the bath composition on the phase structure, microhardness and corrosion resistance was investigated. The present work will compare the effects of incorporation of MWCNTs at different concentrations (1.25% wt, 2.25% wt and 4.25% wt) g/L on the phase structure, microstructure, morphological of electroless Ni–MWCNTs nanocomposite coatings. Where, the structure and chemical composition of nanocomposite coatings were studied by using X-Ray, (SEM) and (EDS). Ni–MWCNTs Nanoomposite coating exhibited much increased remarkably improved corrosion resistance.

Paper ID: 149

Synthesis and Acetyl Cholinesterase inhibitory activity of Some New Oxazole and 1, 2, 4-triazole derivatives bearing Carbamazepine as nucleus

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Abstract. A novel series of oxazole and 1, 2, 4-triazole compounds were synthesized by using carbamazepine as nucleus. The desired molecules were obtained by reaction of cyclization. The structure of the synthesized compounds were clarified using Fourier Transform Infrared spectra copy (FTIR), 1H NMR, and Mass Spectrometry spectral data. Most of derivatives were tested for their activity compared with standards drug. The inhibitor activity of the compounds against Acetyl Cholinesterase enzyme was evaluated. Most of the compounds exhibited more selective inhibitory activity towards Acetyl Cholinesterase, at atime when we observed the compound A4 shows high selectivity against AChE.

Paper ID: 150

Mechanical Properties of Poly Methyl Methacrylate Filled with Orange Peels

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Abstract. The purpose of this paper is to investigate the effect of various weight fractions (2%, 4%, 6%, and 8%) orange peels powder reinforced with PMMA resin on some mechanical properties which were prepared by hand lay-up method, and the utilized in the dental base. Three kinds of mechanical tests were performed on all samples, including; tensile test, flexural test and impact test. The recorded values were tabulated and statistically analyzed by using (Origin Lab) program. Tukey and Scheffe tests were used in order to determine the signification between the means of tests group that are statistically significant when Sig less than 0.05. Results show the incorporation of 8% weight fraction orange peels powder with PMMA resin causes significantly increased in modulus of elasticity, flexural strength and flexural modulus (3.4 GPa, 94 MPa, 6.2 GPa) respectively, while the sample reinforced with 4% orange peels powder has a maximum of tensile strength (56 MPa) compared with samples reinforced with (2%, 6%, and 8%). The value elongation percentage decreased (3.9 %) to (3%) when reinforced with 8% weight fraction orange peels powder compared to the control sample. The impact strength values increased to (11 KJ/m2) in sample reinforced with 6% of orange peels powder compared to control sample (7.4 KJ/m2), while the impact strength values start to decline to (10.7 KJ/m2) in sample reinforced with 8% of orange peels powder. Statistically analyzed, shows that the tensile strength, modulus of elasticity, flexural strength, flexural modulus and impact strength of PMMA resin strengthened by orange peels powder is improved for being a value Sig = 1. Thus, the samples reinforced orange shell powder into PMMA resin are suitable to be used as a denture base.

Paper ID: 151

Morphological and anatomical study of some Italian pear leaves *Pyrus communis* L. cultivated in Iraq

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Abstract. This research comprised morphological and anatomical studies of the leaves of five cultivars of the Italian pear species, belonging to *Pyrus communis* L., they were Abate fetel(A.F.), Beurre hardy(B.H.), Bonne louise(B.L.), Conference(C.), and Doyenne comicem(D.C.). Morphological aspect included dimensions, shape, apex, and margin of the leaf blade, the number of leaves on the last node of the stem, petiole length. The outcome showed the D.C. isolated by bigger dimensions leaf rate were 7.65x4.88 cm, while stick up with B.H. in shape and blade's apex that were ovate and cuspidate. A.F. cultivar separated with entire margin and more number of leaves of the last node of the stem, C. recognize by lengthen petiole, The anatomical characteristics which included thesurface view of leaf epidermis, and cross section of midrib andpetiole. Diagnosing pear cultivars with hypostomatal leaf with actinocytic stomata, the results conducted differences of shape abaxial surface cells, B.H. isolated withhighly tortuous surface, cultivate were differed in the diameter of midrib, moreover the thickness of mesophyll also showed a variation, The B.H. and D.C. were distinguished in vascular bundles and meta xylem shape, they have been Reni, Ovate form respectively, whereas C. had biggest thickness of xylem and phloem. B.H. and C. circular petiole, B.H. also characteristics with biggest petiole diameter, cultivars divided into four groups to petiole vascular bundles. Our results indicated that the anatomical characters were of great taxonomic importance in the diagnosis and classification of pear plant.

Paper ID: 152

Tensile and Morphological Properties of PMMA Composite Reinforced by Pistachio Shell Powder used in Denture Applications

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Abstract. The purpose of this research is to investigate the effect of Pistachio Shell powder on some properties of (heat- cure) PMMA acrylic resin that's popularly used as denture base material, where this natural powder had been add in different weight fraction (3, 6, 9, and 12 wt. %) and different average particle size (53µm, 106µm, 150µm, and 212µm). Tensile and SEM test had been studied, the results where statistically analyzed by using SPSS (one-way ANOVA) program to evaluate the mean value and show the significant difference for each particle size. The results were as the following: the tensile strength and elongation percentage were dropped with increasing the weight the weight of Pistachio Shell powder, while the Young's modulus had been increased with increasing the weight fraction of Pistachio Shell powder and reached its maximum value at (12 wt. %) of average particle size (53µm). SEM results show that the smoothness of fractured surface will increase and that is suggesting a brittle to semi ductile transformation.

Paper ID: 153

Study of the Effect of Building TEA Laser Nitrogen System with Multi-Stage Printed Circuits on the Value of Laser Energy and the Duration of the Outgoing Pulse

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Abstract. In this paper different stage of pulse charging circuit (Blumlein circuit) was design. The laser system consist of different dimension printed board act as capacitor, fast spark gap switch and two parallel electrode made of Brass. TEA Nitrogen laser produce UV radiation with 337.1nm the basic design contain two capacitor with one spark gap while, fourth design consist of four spark gap with five capacitor. As the number of stage rise the overvoltage required for breakdown increase so we can obtain gas discharge and excitation of Nitrogen molecules at lower voltage. The maximum energy obtained for OSBC was1.02 mJ at 25 KV with laser pulse width around 8 ns. The last design with four stage blumlein circuit the energy raised to higher value more than for last design, the maximum energy was 19.01mJ at 25 kv with pulse width around 4.6 ns

Paper ID: 154

Enhanced Surface Acidity in Bifunctional X-Zeolite Catalysts: FTIR Study

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Abstract. Pt/Na-H-X Zeolite samples with different Si/Al ratio were prepared and tested after ion exchange and dealumination. This treatment generates Brønsted acidic sites, modifies the supported metal Na-H-X Zeolite samples and produce higher activity for hexane hydro-isomerization. The concentration of Brønsted acidic sites (Si-OH-Al groups) has been characterized and measured by Fourier transformation Infrared spectroscopy (F.T.I.R.) after adsorption and desorption of ammonia and pyridine. The concentration of Brønsted acid sites varied sympathetically with the ion exchange process and dealumination. This paper highlights (1) the suitability of ammonia and pyridine as a probe molecule to discriminate between active sites located in internal surfaces and that at the external surfaces of medium pore zeolites, (2) the enhancement of surface acidity in Pt/Na-H-X Zeolite by dealumination exhibited highest amount of Brønsted acid sites and higher hydroconversion. The homogeneity of OH groups was obtained by analysis of FTIR.

Paper ID: 155

Removal of Brilliant Green Dye from Aqueous Solution by Electrocoagulation Using Response Surface Methodology

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Abstract. This study proposed batch electrocoagulation with iron electrodes as a simple and economical method for treating aqueous solution containing 250 mg/l of brilliant green dye. Response surface methodology was performed to experiments design. A total of 20 experiments were behaved to study the effectiveness of three important process factors: initial solution pH (5-11), current density (5-20 mA/cm2) and reaction time (10-40 minutes). Multiple response optimization reveals that a maximum dye removal efficiency of 96.1% with minimum electrical energy consumption of 3.857 kW h/ kg dye removed was achieved at optimum conditions.

Paper ID: 156

Development Algorithms for Points Cloud Pre-processing

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Abstract. Reverse engineering (RE) describes the procedure of recording a 3D object, conditioning the digitize data to create CAD models. Modern 3D scanning devices have the advantages of high quality, speed and efficiency in scanning process. These merits led to a huge number of data points that are difficult to deal with by CAD systems. In addition error accompanied with scanning process because of operator or environment. These errors may cause distortions or dissimilarity between the origin and the scanned data. In this research, a methodology had been developed to manipulate and process these data in order to transmit accurate and abbreviated data to CAD system with preserving the original surface details. Algorithms and computer programs using MATLAB program had been developed in order to process data. A vial has been taken as case study to explain the proposed methodology and resulted in points cloud reduction from (359916) points to (10892) points by reduction efficiency of 96.97% and with insignificant error.

Paper ID: 157

Structural and Optical Properties of Cu_2ZnSnS_4 Thin Films Fabricated by Chemical Spray Pyrolysis

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Abstract. Cu_2ZnSnS_4 (CZTS) absorber Layer fabricated by using chemical spray pyrolysis as a fast, cheap and vacuum-free method. The films have been deposited onpreheated glass substrates at 400^{o}C and thickness of about (400 nm) measured by gravimetric method. The structural, morphological, optical and electrical properties of all films have been investigated using XRD, Raman spectroscopy, UV-Vis-NIR spectroscopy and Hall effect measurement. The crystallite size of the prepared films was estimated using Scherer's formula, the maximum crystallite size of (22.44nm) at concentration ratio (Cu/Zn+Sn=1.3M) which is related to $CZTS_E$. Raman shift measurement of the CZTS thin films showed that the main peaks located at (330-335 cm^{-1}). The UV-Vis-NIR absorbance spectra were recorded in the region of (350-900) nm to investigate the optical characteristics. The results have shown that the optical energy gap for allowed direct electronic transition was (1.55-2.31) eV with a high absorption coefficient($\alpha > 10^4$ cm^{-1}) wich is suitable for solar cell applications. The Hall measurement found that maximum conductivity of $(3.1017\Omega.cm)^{-1}$ at concentration ratio (Cu/Zn+Sn= 1.1 M) which is related to $CZTS_D$ thin film.

Paper ID: 158

Enhancement of Bioactive Glass Ceramic Using Magnesium Nano Rod Addition: (B.A.G.C / Mg NRs nanocomposite Materials For Bone Repairing)

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Abstract: Bioactive glass ceramic materials (biomaterials) have been used to restoration, implants and filling defects of bone, these biomaterials have become a developing research field for bone implants applications. In this work bioactive glass ceramic was synthesis then was reinforced by magnesium nano rod. The x ray diffraction analysis of bioactive glass ceramic materials showed that the heat treatment causes a very rapid crystallization process and at 900 °C, a phases $CaSiO_3$,$Na_2Si_2O_7$ and $Na_2Ca_6(Si_2O_7)(SiO_4)$ appears in the bioactive glass matrix. The addition of different weight percentage of magnesium nano rods to bioactive glass ceramic were studied to estimate some properties such as density, young modulus, hardness and impact strength. The results show decreasing in density to 2.06×10^3 $\frac{\boldsymbol{Kg}}{\boldsymbol{m^3}}$ when added 9 % Mg nano rods), these results prefer in bioapplication especially in bone implants. The addition of 9 % Mg nano rods due to increase modulus of elasticity to (≈ 73.45 GPa). The addition Mg nano rods to bioactive glass ceramic due to decreasing the hardness from (9Gpa) to (6.9.5) when 9 % Mg nano rods were added. Impact energy was found to increase from (17.5 J/mm^2) to(27.1 J/mm^2) when add (9 %) of Mg nano rods. Scanning electronic microscope inspection was show the gradually spread of Mg nano rods in the bioactive glass ceramic matrix homogenously and regularly.

Paper ID: 159

Improvement of gr 1018 Steel Mechanical Properties by Liquid Carburizing in Salt Bath

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Abstract. Liquid carburizing is considered one of surface heat treatment techniques of steel, where it is possible to produce surface layers with high hardness and good corrosion-wear resistance. In this study, the use of carbonate in a liquid medium of medium carbon steel GR 1018 has been investigated in term of the hardness of the surface layer and surface mechanical properties of low carbon steel GR 1018. The sample was prepared in a cylindrical shape (20 mm) and diameter (15 mm) by a laminating machine and then smoothed. The results obtained showed that the use of liquid carburizing for steel (Gr 1018) led to an increase in the value of the hardness of the surface layer of the samples. It is found that the thickness of the carburized layer increases more with an increasing period that the samples remain in the salt bath. This leads to an increase in the effective and overall depth carburized layer formed on the surface. The microstructure of the specimens was tested the phase transformations that occur during the carburizing process were restricted, and it was noted the change in the crystal structure of samples gradually between the surface and the heart of the specimens.

Paper ID: 160

Profiling proteomic responses of *Staphylococcus aureus* exposed to Colostrum Hexasaccharide (CHS) through label-free mass spectrometric profiling

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Abstract. To resolve the problem of antibiotic resistant, there is an extensive approach being tried to find natural molecules which protects against pathogen invasion. In this present study we scrutinize CHS effects on protein expression in S. aureus. Colostrum Hexasaccharide (CHS) was collected and purified from Female mares (Equus caballus). Working concentration of CHS were evaluated for its activity on the growth of ATCC S aureus 25923. The ATCC 25923 S. aureus sensitivity towards CHS was determined by MIC test as per guidelines of the CLSI, USA. The proteomic profiling of S. aureus proteins was obtained after the treatment of CHS (at IC value) with comparison to untreated control with the usage of in-solution digestion following the LC-MS/MS analysis. Identification and differential expression profile for targets and sequence of the protein were obtained through MASCOT, Swiss-Prot, and TrEMBL search engines and label-free quantification (Progenesis QI). The growing turbidity of S. aureus was reduced over the time in concentration dependent manner. The IC50 concentration value was quite high and it was more than 5mg/ml. CHS influenced around 30 proteins in comparative proteomics analysis. Five proteins named DNA-binding protein HU, MarR family transcriptional regulator, 40S ribosomal protein L7/L12, 3-hexulose-6-phosphate synthase and general stress protein were significantly (Based on ANOVA value (>0.05; p value) differentially expressed. Based on fold changes elongation factor Ts, Coagulase, and multiple resistance and pH adaptation (Mrp)-like protein considered to be expressed differentially. In this study we report the protein targets of CHS of clolostrum to that in S aureus pathogen on which is able to attenuate the growth of S aureus and may play an effective antipathogenic novel molecule to serve as the lead compound.

Paper ID: 161

Effect of Alteration in Nutritional Style on Liver Function Tests and General Stool Examination

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Abstract: Our previous work showed that changing in nutritional style play an important role in modifying the architectural aspects of various organs at the tissue level such as intestine and liver. Those findings need further investigation at physiological levels, so this work aimed to study the effect of transition from a completely plant-based diet to 10% animal products on liver function tests and general stool examination in mice. Eight-week-old Balb /c male mice were divided into two groups (n=8); the first one fed on the restricted diet containing 10% of sheep's brain homogenate, and the second fed on a conventional diet for 7 days ad libitum that act as a control group. At the end of the experiment, the characteristic of stool was examined by general stool examination test. After that, all mice were sacrificed and the blood samples were collected from eyes by surgical removal of the eyeball to determine blood alanine transaminase ALT and aspartate transaminase AST. The results showed that the stools of the restricted group were black and solid; have indigested material, fatty drops, and monilia; and have a high number of pus, RBC, and epithelial cells. ALT, AST, and ALT/AST ratio were significantly higher in the restricted group compared to control. On the other hand, ALT and ALT/AST ration have significant positive correlation with general stool examination parameters. It can be concluded that changing in nutritional style rather than conventional diet plays a crucial role in modifying the architectural aspects of different organs not only at tissue level but also at the physiology level especial in the digestive system due to indigestion and absorption processes, negative immune responses and even neural reflex. The effect of this diet changing on neural reflex need farther research.

Paper ID: 162

Precast Epoxy Fasten SIFCON Layers as a Retorting Material for Defected Concrete

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Abstract. Using of Slurry infiltration fiber concrete (SIFCON) in repairing concrete structure is one of the techniques used to extent theconcrete structure's service life. Many researchers investigated the superior properties of SIFCON especially, in flexural strength, ductility, and toughness. These properties can reflect a positive effect on the exited defects concrete structure. This study tries to show the effect of a various volume of steel fiber (6, 7.5, and 9) % that used to cast different thickness SIFCON layers (15, 25, and 35) mm on the response of prisms to the load-deflection curve, ductility, toughness, and flexural strength. Also, the location of the glued SIFCON layer (top, top and bottom, and jacking) were studied according to the properties mentioned above. It was observed that increasing of both the steel fiber percent and SIFCON layer thickness evolve the load carrying capacity, ductility, and toughness of the strengthen prisms. The maximum load achieved is about 10 times of control. The toughness was about 105 times than control. The ductility also improved by using epoxy bonded SIFCON layers.

Paper ID: 163

Antibacterial Activity of Novel Gold Nanoparticles Agents

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Abstract. The emergence of antibiotic resistant strains of nosocomial pathogens such as *Staphylococcus aureus* and *Escherichia coli* has become one of the potential threats to global health and therefore require an immediate need to develop new approaches to tackle resistance to antibiotics. Nanoparticles can be promising therapeutic option against antibiotic resistance. In this study, functionalised gold nanoparticles (AuNPs) were prepared by chemical reduction method and their antibacterial activity against *E. coli* (NCIB 8277) and S. *aureus* (ATCC 6538P) had been evaluated for their efficiency. Ligands functionalised these AuNPs were characterised using Attenuated Total Reflection (ATR), Electrospray Ionisation Mass Spectrometry (ESI-MS) and Nuclear Magnetic Resonance (NMR). While UV-visible Spectroscopy, Transmission Electron Microscopy (TEM), and Dynamic Light Scattering (DLS) were used to measure the stability of these AuNPs for up to 3 months. Four concentrations of AuNPs (1.36, 0.63, 0.36 and 0.18 μg/ml) were utilised for estimating the bacterial growth rate by agar well diffusion and microdilution methods. The dose dependent activities of prepared AuNPs were observed. Bacterial sensitivity to AuNPs was found to vary depending on bacteria type. Compound 4A- AuNPs was revealed the greater effectiveness against both bacteria at various doses. The synthesised AuNPs have potent antibacterial activity against *E. coli* and *S. aureus* and can be used to control infection.

Paper ID: 164

Novel Microwave Heating Temperatures and Pharmaceutical Powder Characteristics

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Abstract. Temperature is one of the important factors that have significant influences on the physical and chemical characteristics of the dried materials, mainly the pharmaceutical solid powders. Pharmaceutical solids can be dried by different conventional drying methods, in the present work; however, microwave radiation technique was used to dry the moisturized newly formulated naproxen-sodium drug. The exploitation of the microwave radiation energy in the pharmaceutical field is limited, and the available information about the interaction between the electromagnetic radiations and the pharmaceutical material is still scarce. Therefore, this work aimed to explore the effects of the microwave radiation temperatures on the elimination of the moisture, the morphology, the crystalline structure, and the size of the dried particles, and the chemical groups of the naproxen-sodium drug. In the present research, newly formulated naproxen-sodium was prepared and wetted by a wet granulation process. The prepared wet granules were dried at different heating temperatures using microwave radiation energy. Powder X-ray diffraction, Fourier-transform Infra-red spectroscopy, moisture analyzer, and scanning electron microscope were used to characterize the non-moisturized drug powder (the reference powder), the wet granules, and the dried granules. The results of this study exhibited that the use of the high microwave radiation drying temperatures was more effectual in the removal of the moisture from the formulated naproxen-sodium drug than that at the low temperatures. Even though there was no significant variation in the chemical structure of the dried granules, crystallinity, morphology and particle size were relatively reformed with the variation in the microwave heating temperatures.

Paper ID: 166

Comparison of Local Gasoline Fuel Characteristics and SI Engine Performance with Commercial Fuel Additives

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Abstract. Fossil fuel is the main source for powering internal combustion engine in the existing design. Though different sources of renewable and alternative fuels were suggested, gasoline fuel still the dominant source for operating SI engine. In this study, a comparison has been conducted to evaluate the fuel properties and engine performance with commercial additives. Has been studied locally available types of gasoline fuel, which include local gasoline M0, local enhanced gasoline M2, commercial enhanced gasoline M3, in addition to using a type of commercial fuel optimizer with local gasoline M1, the addition ratio (1 / 120) by volume. It was adopted local gasoline M0 as a reference for comparison. Performance tests are conducted by using different fuel (M0, M1, M2, M3) in a single-cylinder SI engine under the wide-open throttle (WOT) condition at a wide range of engine speeds (1200–2800 rpm). The results showed an increase octane number and viscosity of fuel by about (19.77% 11.538%) respectively and the reduction of the heating value of fuel by about 2.78% when using the commercial fuel optimizer. As well as increased brake torque and brake power at an average of 6.852% compared to fuel M0. Also, brake specific fuel consumption and brake thermal efficiency improved by an average of 4.07% and 7.27%, respectively. The best performance was with fuel M1 at which the brake torque and the brake thermal efficiency were at 2800 rpm higher than the M0 fuel by 18% and 10.9% respectively.

Paper ID: 167

Ultimate Failure Capacity of the Geopolymer and Ordinary Reinforced Concrete Domes Subjected to a Concentrated Load

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Abstract. Geopolymer or alkaline concrete is a modern binder material characterized as an ambient friendly product within the construction field. Present study has investigated the geopolymer concrete mix used in the dome structural members compared with the use of ordinary concrete mix. Geopolymer concrete mixes are produced according to certain molecular ratios govern its design strength, so that present study has adopted molecular ratio of 14 mole (14M) as an alkaline molar concentration forming a binder material for the coarse and fine aggregate. Laboratory tested coarse and fine aggregate were used in both of geopolymer and ordinary concrete mixes. Two models of domes were made using geopolymer concrete mix while other two models were casted by the ordinary concrete mix and both types were reinforced with single layer of steel wire mesh. Later, all models were tested under uniaxial concentrated load subjected vertically on the peak of dome. Results showed that high ultimate failure load could be achieved for the geopolymer reinforced concrete as well as in the ordinary reinforced concrete when they subjected to a concentrated load on the dome's peak.

Paper ID: 168

Analysis and Recovery of Trace Elements Abundant At the Iraqi-Al –Qaim Phosphogypsum

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Abstract. Trails were performed for the recovery of group trace elements, including the radioactive elements, partitioned with the phosphogypsum (PG) stockpiled in around 12 million tones at Al-Qaim in Akashat Phosphate Fertilizer State Company. The method utilizes the concept of the preferential solubility of phosphogypsum in water over other metal sulfates, phosphates, silicates and others may exist with phosphogypsum. At the limit of PG solubility a colloid is formed due to the in-soluble and partially soluble constituents including various trace elements which are settled down after 20-45 minutes. Shorter time settlement was achieved in the presence of polyacrylamide as coagulant. The dissolution process of PG in water has been studied using conductivity technique. De-ionized water show better solvation power for PG and better separation properties compared with potable water. The efficiency of separation and settling of the suspended colloidal particles was studied as function of pH, temperature, time and the presence of flocculent polyvinyl acrylamide. The abundance of the trace elements in PG was determined using x-ray fluorescence, atomic absorption and induced plasma emission spectroscopy. Radioactivity accumulated by the 238U and 232Th decay schemes were measured for 226Ra-228Ra and 222Rn gamma and Alfa spectrometry. Due to their low solubility, it is anticipated that appreciable percentage recovery for the alkaline earth elements Sr, Ba and 226Ra,228Ra , while partial recovery is expected for the other elements i.e., Cu, Zn, Pb, Fe, R.E , uranium and thorium. Phospgogypsum was finally purified with acceptable properties for industrial and agricultural applications.

Paper ID: 169

Fabrication and Investigation of Hybrid Perovskite Solar Cells Based On Porous Silicon

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Abstract. Solar energy is one of the main resources in our modern life. Photovoltaic panels are one of the most important technologies that make use of solar energy good because the photovoltaic cells harvest light from the sun and turn sunlight into electrical energy. The paper presents the effect of incorporating (CnO/PbI2/ CH3NH3I/ZnO) on the porous silicon (p-Psi), by the drop casting technique procedure temperature 70°C. Structural, optical and morphological properties of (p-PSi, CnO , ZnO) nanoparticles were characterized by X-ray diffraction,UV-Vis spectrophotometer, scanning electron microscopy,and atomic force microscopy. Our way of producing hardware with the maximum Power Conversion Efficiency (PCE) of solar cell is 8.21% and the filling factor is 41.4%, revealing by promising To achieve high quality polycrystalline perovskite films with superior optical electronic properties Can pave the way towards efficient optical conversion.

Paper ID: 170

Desulfurization of Model Gasoline Using Metal Organic Frame-work

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Abstract. This work is to study the batch adsorption desulfurization process for model gasoline (isooctane + thiophene) and to prepare low-cost adsorbent MOF-199 for desulphurization of model fuel by adsorption. A MOF-199 (metal-organic framework) was prepared under solvothermal conditions and characterized with a BET surface area and a powder X-ray diffraction. The effect of concentration of thiophene, adsorbent dose, contact time, and the temperature was investigated in Batch process for model gasoline. The residual sulfur concentration in model fuel was decreased from 1500 to 148.2 ppm. Corresponding to a removal efficiency of 90.12 %, at optimum conditions for contact time 4 hours. The experiment showed that MOF-199 was effective in removing the thiophene as well as its reusability.

Paper ID: 172

Synthesis and Characterization of Some New Schiff Base Containing 4, 5-Dihydroisoxazole Moieties

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Abstract. A series ofSchiff bases combined with 4, 5-dihydroisoxazoelemoieties as derivatives of chalcone were synthesized. Schiff basecompounds containing chalcone group were prepared by the treatment of one mole of dicarbonyl compound, such as benzil, with one mole of different amine compounds and the products were reacted with acetone. The results were reacted with hydroxylamine hydrochloride in ethanol and glacial acetic acid as a catalyst for synthesis various derivatives of 4, 5-dihydroisoxazole moieties that combined with Schiff bases. The structures of the new synthesized compounds, Schiff bases combined with 4, 5-dihydroisoxazole moieties, have been established on the basis of their spectral data (FTIR, ^{1}H NMR, ^{13}CNMR and MASS).

Paper ID: 173

Use of Artificial Neural Networks for Predicting Water Separation in Water Oil Emulsion

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Abstract. An accurate prediction of the dehydration of a crude oil is necessary for design, selection and petroleum operations. The aim of this research was to predict the separation of water using the FFANF artificial neural network. Factors studied include the effect of mixing time, mixing speed, emulsification temperature and shearing rate. The models of water separation were developed using experimental laboratory data. The results showed that the expected relationships had a perfect correlation with the tests achieved at R = 0.99992 and the top validation performance at 143.3434 and RC = 0.98. The results also showed that the model obtained was efficient in comparison with the conventional ANN in predicting water separation with an overall improvement of 39

Paper ID: 174

Investigation Study of Vertical HelicalCoil Heat Exchanger

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Abstract. Modern techniques are invented to promote thermal energy and reduce the size of the heat exchanger. First one is the passive technique which does by adding fluid or change surface geometry. The second way is the active technique, it achieves by using an external force on the surface or fluid or appending a magnetic field to the fluid. A vertical helical coil heat exchanger (VHEX) one of the passive techniques, it is more efficient than straight tube heat exchanger. This PAPER FOCUSES on the comparison between the straight pipe; and VHEX. The test consisted of two cases, VHEX and straight tube. Counter water flow was selected as the working fluid in the shell and tube heat exchanger sides. Coldwater was at 30 ^{o}C entered to the shell, and the hot water at 60 ^{o}C entered to the tube. The flow at the shell was kept constant, while the tube flow was changed. Sixteen experimental runs were one at different flow rates. The results showed the effectivity of the VHEX was better than the straight tube. Heat transfer was increased with increasing water flow rates. Nusselt Number at the straight pipe was less than the helically coiled tube.

Paper ID: 175

Performance Enhancement of PCTWs Technique by Employing RZ-coding in Phase-Modulated Optical Communication Systems

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Abstract. Phase-modulated optical communication systems that employ phase-conjugated twin waves (PCTWs) technique are becoming attractive since they transfer a high information rate for longer transmission distance. However, noise of optical amplifiers and its interaction with fiber nonlinearity lowered efficiency of PCTWs technique. In this paper, we proposed a new method to enhance the efficiency of PCTWs technique by using return-to-zero (RZ) coding. In proposed method, twin waves are firstly modulated with m-array quadrature amplitude modulation (mQAM) format and then their envelopes are shaped by RZ-coding. Consequentially, RZ-mQAM twin signals are multiplexed and launched into optical link. The received signals are synchronously combined to eliminate nonlinear distortions. To show influence of proposed method, system performance is mathematically modelled and numerically studied. The results reveal that transmission operation is noticeably enhanced. Transmission distances of the 4QAM and RZ-4QAM systems with PCTWs technique are elongated by 44.4% and 73.3%, respectively, in comparison to that of 4QAM transmission.

Paper ID: 176

TiO_2 Nanoparticles Supported on PET Nanofibers for Photocatalytic Degradation of Methylene Blue

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Abstract: Polyethylene Terephthalate (PET) nanofibers were synthesized by electrospinning and then composited with TiO_2 nanoparticles. In this study, PET nanofibers were dipped into TiO_2 nanoparticles,whichwasoperated thenforthephotocatalytic degradation ofmethyleneblue(MB) inaqueoussolution.Fourier transform infrared spectroscopy (FTIR), and scanningelectronmicroscopyanalysis isusedtostudythesurface ofnanofibermorphology.UV-visiblespectrophotometryisusedtodetermine the concentration of (MB) after photodegradation. Photodegradation of (MB) in this study has shown that the degradation efficiency was affected by time. The resultshaveprovedthatTiO_2 /PET nanofibersgothigh photodegradationefficiency inashorttime.

Paper ID: 177

Interpretation of Water Quality Changes in the Regulation Lake of Mosul Dam using Principal Component Analysis Method

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Abstract. In this research the principle component analysis technique carry out on water quality parameters of the regulation lake for mosul dam reservoir in city of mosul-north of Iraq in to give more easier and simpler understanding and analysis of these data. The analysis of data revealed that there are four components have an effect on the variation of water quality of the regulation lake; the first component includes temperature, Dissolved oxygen, pH, –EC., Rainfall intensity and NO_3^{-1} by 36.286% which depict the projection of atmosphere effects upon the water of the lake. The second component includes sichi disc depth, - Algae, SiO_3^{-2} and No_3^{-1}, which may be a projection of the algae increase and decrease through the lake with 26.267%. The third components includes SiO_3^{-2}, PO_4^{-3} and Chloroform A concentration that depict the impact of flood from the neighborhood lands with 13.575%, the fourth component contains Turbidity and NO_3^{-1} with 8.366% and can be connected with the overturn that occurs at the main lack. The other remaining variance of water quality parameters match to another numerous factors effect on the regulation lake but in fewer portions. Finally we can rely the principle component technique in administration and handling of lakes, rivers and any water recourses by limitation and restriction the most important sources of pollution and percent for each one.

Paper ID: 178

Assessment of the health safety of bottled drinking water in Iraqi local markets using the WQI model.

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Abstract: The study aims to determine the health safety of bottled water in the local Iraqi markets. Water samples were collected randomly for 15 brands (three replicates). Physical, chemical and bacterial tests of water samples were conducted with the application of the water quality model (WQI) to determine the quality of the studied water. The results showed that all the physical and chemical parameters analyzed were within the desired limits of the WHO, Bacteriological analysis showed that the total bacterial count of bottled water was within the limits of who except for the samples of Kani and 133 brands, which rates were 49 and 29 cells/ml and the absence of faecal coliform bacteria and WQI values ranged from 11.9 to 114.4, which were classified as excellent to poor Category.

Paper ID: 179

Evaluation the influence of pH and temperature on the manufacturing process of latex paint

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Abstract. This The formulation of latex paint manufacturing process depends on broadly experimental parameters, however, it is not easy to foretell the properties of the specific formulation, that means a considerable number of trials have to be run before the desired technical properties required are obtained. The goal of the first stage of the manufacturing process in latex paint is how to reach the maximum viscosity of thickener required to the second stage of pigments and extenders grinding and finally the addition of binder resin polymer. In this research, the thickener was added early before the second stage in plant application in batch system technique. The study aims to study the effect of the pH and temperature on the time of thickening process as well as the effect of temperature rises due to a high speed of mixer in the second stage on the polymer adhesive power. The pH ranging from 3 to 11 and temperature 10 ºC to 40 ºC was changed in this research as appropriate with Iraqi climate change. The results obtained revealed that at pH of 3 with temperature 10 ºC thickening time need to very long time while at pH of 9.5 with temperature 40 ºC need to short time, that leads a significant reduction in the time required to match the first stage of latex paint that giving closer of pigments and extenders requirements to keep the final product cost down by save energy consumption. Also, it appears from this study that the high speed of mixer after the addition of polymer decreases adhesive power which means that the final product weak to wash ability.

Paper ID: 182

Synthesis and Biologically Activity of Novel 2- Chloro -3-Formyl -1,5-Naphthyridine Chalcone derivatives

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Abstract. A new and efficient procedure has been described for the synthesis of 2- chloro -3-formyl -1,5-Naphthyridine(1)from condensation of N-(pyridine-3-yl) acetamide in presence of dimethyl form amide and phosphorous oxy chloride through Vilsmeir Haack cyclization. The condensation of compound (1)with acetophenone ,p-hydroxy acetophenone,2-acetyl pyridine,2-acetyl furan and acetyl indole in the presence of ethanolic sodium hydroxide through Claisen- Schmidt condensation give quinolinyl chalcones(2a-e)and its further treated with dimethyl sulfoxide in the presence of iodine to obtained iodo chalcone compounds (3a-e).The smooth and selective bromination of chalcones (2a-e)afford dibromide compounds(4a-e).The structure of synthesizedcompounds were confirmed by spectral and physical methods .Some of the synthesized compounds were found have a good biological activity against gram positive bacteria such as staphylococcus aureus and staphylococcus epidermidis and moderate activity against gram negative bacteria such as Escherichia Coli and proteus vulgaris.

Paper ID: 183

Enhancing Physical and Mechanical Properties of Pervious Concrete

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Abstract. An attempt to improve the physical and mechanical properties of pervious concrete was presented in this study. To achieve this purpose, inclusions of fine aggregate or adding styrene butadiene rubber (SBR) were considered. The effect of these parameters on compressive and flexural strengths, density and water discharge were investigated. The results indicated that the inclusion of sand has a positive effect on strength while it results in decreasing the discharge and increasing the density. SBR has a lower effect on the mentioned properties comparing with that of sand. However, mixes with SBR have higher strength than that with no polymer content. The results also pointed out that mixes with sand content between 15-30% (as a percentage of total weight of aggregate) and those of SBR dosage up to 5% (as a percentage of cement weight) are the best as they reveal, comparatively, acceptable strength and permeability.

Paper ID: 185

Computational study of geometry, stability and electronic structure of Ti@C32 endohedral fullerene

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Abstract. Computational study performed on pure C32 and endohedral Ti@C32 fullerenes based on the six conventional isomers built up of pentagons and hexagons. The equilibrium geometries, electronic structure, molecular volumes and encapsulation energies have been calculated. The calculations showed that the structure with D3 symmetry is of highest stability. In spite of the small size of C32 cages, our calculations expecting that Titanium atom can be stably encapsulated in all the isomers. The geometry optimization performed using molecular mechanics followed by AM1 and PM3 semiempirical methods to save computation time. While electronic structure performed using density functional theory (DFT) at B3LYP/6-31+G* level over the six isomers for the first time. We calculated the HOMO-LUMO energy gaps of pure and endohedral fullerenes at the same level of theory to notice the effect of the encapsulation on the electronic structure of these carbon cages. On the basis of encapsulation energy and energy gaps the stabilities have been investigated and discussed.

Paper ID: 185

Evaluation The Activity Of Some Medicine Plant Extracts As Roots Promoter.

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Abstract. The present study was carried out in the botanical garden /department of biology / college of science in ALmustansiriyah University, Baghdad. During 2017-2019 under natural environmental conditions in green house, to investigate the effect of some natural products (Liquor ice roost, Garlic, Black cumin seeds and Egyptian cassia flowers extracts) as an alternative chemical growth regulators on rooting response, on Egyptian cassia shrub, olive, Punica, Myrtus, Lantana and Ficus stem cuttings. The extract concentration was (2.5 and 1.25 gm.\ L), the IBA in 1000 mg \ L concentration with (48) hour dipping time. The layout of the experiment was complete randomize design (CRD). The results indicated that the (2.5 gm.\ L) concentration of cassia extract gave the highest values in all traits studies (rooting percentage, root numbers and root lengths, leaves number, new branches number and stem length), compare with IBA and control treatment. It can be concluded that treating semi hardwood cuttings with Egyptian cassia flowers extracts which are available without any cost as natural growth regulator instead of the expensive chemical synthetic IBA, in order to enhance rooting and vegetative growth.

Paper ID:186

Theoretical Study of Bulk and Nanomaterials under High Pressure

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Abstract. Vinet and Birch-Marnghan EOSs as well as Nano EOSs have been used to evaluate variation of V/V_0 against high pressure in bulk and Nano forms for Ni, Cu, and Ag. The results of different equations were compared with each other and with experimental data. The results of the different EOSs were compatible with each other, indicating the possibility of using the EOSs of bulk materials for the calculations of nanomaterials. Calculations of variations of bulk modulus with high pressure, for the same materials, in the cases of bulk and nanomaterials were completed, and the results also showed the possibility of using EOSs of bulk materials for nanomaterials too**.**

Paper ID**:** 187

Desalination of Shatt al-Arab Water by Vacuum Membrane Distillation (VMD)

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Abstract. The current work focuses on the desalination of Shatt al-Arab water) using a flat sheet membrane hydrophobic polytetrafluoroethylene (ePTFE) by the vacuum membrane distillation (VMD. The effect of key parameters like temperature (40, 45, 50 and 55 ^{o}C), vacuum pressure (18, 13, 8, and 3 kpa), and the flow rate (30, 60, 90, and 120 L/hr) were studied. The results showed that the rise in temperature of feed water resulted in rising in the permeate flux, while the reduction of pressure and flow rate led to increase of permeate flux. It was found that the best permeate flux obtained was approximately 30 kg/m^2.hr ,which was obtained at temperature of 55^{o}C, vacuum pressure 3 kpa , and flow 30L/hr. At these conditions the rejection of salt changed into 99 percent and the permeate of conductivity became much lower than 20 µS/cm. Of all the above, it was found that (VMD) was highly efficient in salts removing of the Shatt al-Arab and potentially it can be used to obtain clean drinking water.

Paper ID: 188

Mechanical Properties of Epoxy/Nickel Nanocomposites Prepared By Ultrasonication-Shear Mixing Method

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Abstract. Metal nanoparticles (Nickel Ni) filled epoxy resin EPLV (Nitofill) composites are found numerous applications now a days. The mechanical properties of epoxy/Ni nanocomposites filled with Ni nanoparticles (20 nm) were investigated by using tensile test machine. The influence of Ni nanoparticles (filler content 1-5 vol.%) on nanocomposites was studied.The experimental results indicated that the increase nanocomposites bearing for applied force and hence increase tensile strength and modulus of nanocomposites accord with increase the addition of Ni nanoparticles performance improvement increase multiply four times approximately, and high content of Ni nanoparticles are unfavourable for increasing the mechanical properties of the Ni nanocomposites. The results have been supported with scanning electron microscope SEM to help understand enhancement mechanisms.

Paper ID: 189

Optimization of Initial Blank Shape for Flexible Micro Deep Drawing of Square Parts

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Abstract. Micro flexible tool-assisted sheet metal forming is one of the forming techniques that have increasingly attracted extensive attention of researchers. This forming process is an appropriate technique for producing micro components due to its inexpensive process, high-quality products, and relatively high production rate. This study investigates the optimization of initial blank shape for micro deep drawing technique of square parts. The function of the blank shape optimization in this study is to produce micro square parts of SS304 with net-shape and flange free. The finite element simulations are achieved using the commercial code Abaqus/Standard. The results reveal that the proposed technique of blank shape optimization is feasible to be adopted for producing micro square parts with remarkable application capability in mini-part production technology.

Paper ID: 190

Laser Transmission Welding of PMMA Using IR Semiconductor Laser Complemented By the Taguchi Method and Grey Relational Analysis

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Abstract. This work presents the laser transmission welding of a transparent slab and an oblique slab made of poly (methyl methacrylate) polymer (PMMA). A semiconductor laser with a 808 nm wavelength, 2W output power and a 2 mm beam diameter was used. A transparent slab with three different thicknesses (2.6, 3.7 and 4.3 mm) was fixed tightly onto the oblique slab (dark color) using a forced clamp to prevent the movement of the slabs during the welding process. Three different speeds (44, 113 and 150 mm/min) of the welding process were applied to the prepared samples... Results indicate that width and depth are inversely proportional to welding speed. The Taguchi method and grey relational analysis were used to optimize the appropriate values for the welding process in this research. The results exhibit good agreement with those of the Taguchi method and grey relational analysis.

Paper ID: 191

Investigation of Some Physical Properties of Mn Doped ZnS Nano Thin Films

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Abstract. undoped and Mn-doped zinc sulfide thin films were prepared on glass substrate by spray pyrolysis technique (SPT). XRD, AFM and UV–visible spectra measurements were done to explore the effect of doping on structural and optical properties of ZnS films. X-ray diffraction illustrates polycrystalline nature of the films increases via increasing Mn doping. Crystallite size evaluated by Scherrer's formula shows increasing with increasing doping. Average diameter for undoped ZnS is 84•78 nm and it increases to 96•93 nm for 3%Mn-doped ZnS. As Mn doping concentration increases optical band gap of films decreases.

Paper ID: 192

Effect of Li Doping on Structure and Optical Properties of NiO Nano Thin-Films by SPT

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Abstract. Structural and optical properties of undoped NiO and Li doped NiO thin films at a volumetric content of (1% and 3%) by spray pyrolysis (SPT) were thoughtful. X-ray diffraction patterns indicate that deposited films are cubic polycrystalline with a dominant peak at (101) plane. The study assure that Li doping did not affect the structure or dominant peak. Average crystallite size was set to be in the range of 11.08– 21.76 nm with an average roughness of (0.33-0.59) nm was evaluated by atomic force microscopy. Transmittance values of undoped NiO and Li doped films reaches 85% in Vis- NIR regions. Optical energy gap values for undoped NiO and Li were equal to 2.94, 3 and 3.06 eV respectively.

Paper ID: 193

Utility of Silver Nanoparticles as Coloring Sensor for Determination of Levofloxacin in Its Pure Form and Pharmaceutical Formulations Using Spectrophotometric Technique

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Abstract. This study included the use of silver nano-particles (AgNPs) as colorimetric sensors for determining levofloxacin drug, that is one of fluoroquinolone family drug. The interference between levofloxacin drug and Ag-NPs produces new peaks measured in 507, 435 nm for Ag-NPsI and Ag-NPsII respectively. With regard to optimized conditions, certain perfect linear relationships (R2=0.9991, 0.9855) have been acquired, in range (1-24), (1-12) µg/mL for Ag-NPsI and Ag-NPsII.The examined method's analytical performance has been audited, also the results have been acceptable, the impact of pharmacological action related drugs was studied and no interferences were showed.Several pharmaceutical dosage forms that containing levofloxacin have been effectively examined via studied approach with optimum degree of precision and accuracy, such approach could be environmentally safe since water is considered as the reaction solvent that might be the major considerable green solvent and doesn't need exhausting extraction or various treatment approaches..

Paper ID: 194

The Protective role ofAqueous Extract of Grape Seeds*Vitis vinifera* in Some Biochemical Parameters and Histological Changes in Methionine For Liver, Kidney and Heart in Mice (*Mus musculus).*

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Abstract. The current study was conducted for the period (10/4/2019 to 1/6/2019) on the white mouse of Swiss origin for the purpose of demonstrating the effect of methionine on the appearance of tissue lesions of some members and the possibility of treatment with extract grape seeds , And used 16 animals of white mice for this purpose, was used oral dosage of methionine dosage for 10 days and treatment with grape extract for 30 days .The results of the study of the histopathological effects in the liver, kidney and heart tissues of the groups treated with methionine showed changes in the tissues of the heart, liver and kidneys, which were characterized by the presence of hemorrhage, lymphocyte infiltration, necrosis of cell cytoplasts, and nucleus. The fourth group, which included the best grape seed extract group among the three concentration groups of the three aquatic extracts, showed a very good improvement compared to the first and the second group and the third group where the closest natural form of the tissue was found in the control group, This is due to the different susceptibility of the body of the animal used in the study to the similarity of treatment with the extract of the seeds of aqueous grapes. And that the level of enzymes decreased when treated with methionine and that the levels approached the control group when treatment with the extract of water grapes with increasing concentrations.

Paper ID: 195

Potential Activity of Silver Nanoparticles Synthesized By Iraqi Propolis on Phagocytosis

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Abstract. This Study Aimed to Synthesis and Characterized Silver Nanoparticles using Iraqi Propolis then Inversigate Their Ability in Induce of Phagocytic Cells. The Synthesis of Silver Nanoparticles by on The Green Synthesis Was Confirmed using Different Parameters, Color Changes, and Then Conformed by of UV Visible Spectroscopy. The Morphology Was Characterized by Sem. Moreover, Their Effectiveness in Stimulation of Phagocytosis Had Been Studied. The Results Showed Significant Increases in The Ability of Phagocytic Cells in The Presence of Nanoparticles As Compared With Non-Treated Cells. The Results Suggested That Silver Nanoparticles Synthesis Using Iraqi Propolis Act as Immunomodeulater andcouldbe used for Pharmaceutical Applications.

Paper ID: 196

On the Performance of Free Space Optical Communication Link Over Dust Environment

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Abstract. Dust storm considers a new influence on free space optical communication (FSOC) link. It is referred to the suspended particle in the atmosphere at the desert environment. A few information about dust storm imposes on us to explore the dust effect on the performance of (FSOC). This paper investigated the realization of FSO link under dust situations and take into account the effect of dust concentration. Some of the metrics used for the assessment of system including received optical power, channel capacity, signal to noise ratio (SNR), bit error rate (BER). It has been found that dust is a severe deterioration that give rise to the link decay under high concentration of dust. Moreover, we noted that the system suffers from working for the long optical link. The increase in the concentration of dust makes the visibility of weather is low, this reason leads to an increase in errors of transmitter data. Furthermore, the system can be work with efficient channel capacity. Therefore, dust can be deem as the decadence optical link in FSO.

Paper ID: 197

Adsorption of Dye Yellow No.6 from Synthetic Wastewater by Activated Carbon Derived from Waste Polymer via Microwave Irradiated

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Abstract. Wastewater containing medical dyes is one among the foremost essential contamination effects of natural aquatic ecosystems. The current study investigates the optimal operating conditions for removal of dye (Yellow No.6 ($C_{16}H_{10}N_2Na_2O_7S_2$)) from synthetic wastewater. Experiments were conducted on activated carbon (AC) prepared from waste polymer through microwave irradiated. Effects of the adsorption parameters (initial dye concentration, amount of adsorbent, and system temperature) on the dyes removal efficiency were study and optimized by response surface methodology (RSM). The optimal operating conditions for dye removal were establish at an initial dye concentration of 30 mg/l, amount of adsorbent of 0.022 g and system temperature of 32^{o}C with an adsorption removal efficiency of 98.72%. The adsorption removal efficiency increased with increasing the dosage of activated carbon from 0.005 to 0.03 g. While the increase in initial dye concentration from 25 to 100 mg/L and system temperature from 25 to 50oC caused decrease in removal efficiency. The adsorption removal efficiency increased with increasing the dosage of activated carbon from 0.005 to 0.03 g. While the increase in initial dye concentration from 25 to 100 mg/L and system temperature from 25 to 50^{o}C caused a decrease in removal efficiency.

Paper ID: 198

A Practical Study of the Geogrid-Pile Foundation System in Loose Sandy Soil under the Influence of Halabjah Earthquake

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Abstract. This research carried out to find solutions for address the soil and improve the disposal of the foundation to reduce the damage caused by seismic activity. Nelton CE121 geogrid has been used experimentally with single pile and pile groups in loose sandy soil with relative density reach to 30% to study the settlement, the tip load and the horizontal displacement of the pile in the case of presence and absence of geogrid. The results in dry state show that the settlement ratio in the direction of shaking reduced from 46% to 37.5% for single and 4 piles respectively, the tip load is decrease when using geogrid, and the tip load in raw one (front raw) are smaller than in raw two (rear raw). In saturated soil, it is found that in the first shallow layer the liquefaction occurred with and without geogrid but when using geogrid the excess pore water pressure (u_1) decrease in a ratio of 17%. For unreinforced sand the maximum pore pressure ratio (r_u) recorded pre-selected in the three depths was (r_{u1}=1.04, r_{u2}= 0.81 and r_{u3}=0.68), while for reinforced sand with Nelton CE121 (r_{u1}=1.0, r_{u2}= 0.70 and r_{u3}=0.68).

Paper ID: 200

Synthesis of new S, N, O-alkylated Benzo[d]imidazo [2,1-b] thiazole and The Study of Their Biological Applications

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Abstract. A series of benzo[d]imidazo[2,1-b]thiazole[BIT] derivatives were designed, synthesized and rectified for their cytotoxicity against cell line of HepG2 human liver carcinoma. Preliminary results showed that two of three examined [BIT] compounds a6 and b1b showed an importantant antiproliferation toward human cancer cell line (HepG2), where the IC50 values were 104.9 and 160.7 $\mu g.ml^{-1}$ respectively. The derivative a6 could be considered as the probability leads up to developing them as a novel anti-cancer effective agent, while compound b1b appears to be active at a certain level of concentrations of HepG2 human cancer cell line. The studies suggested that derivative a6 has the potency to be employed up for further, especially against hepatocaricinoma.

Paper ID: 201

Improvement the Efficiency of the Solar Cells Using Nanosizing Process (Photochemical Etching)

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Abstract. The enhancement of photovoltaic (n-p/Si solar cell) has been carried out. The development is based on a surface texturing of the solar cell. The photochemical etching technique was used in the preparation of the n-side of silicon solar cell. The samples were exam were by Atomic Force Microscope (AFM) which show that the average pores diameter in the order of 55nm, and the thickness of the etched layer changed from 1.1nm to 56nm, which cause increase the surface area of the silicon solar cells that expose of the to the illumination. The efficiency conversion of the photovoltaic (PV) was tested showing an enhancement to the change on efficiency of the silicon solar cells, the best efficiency was obtained by treating the solar cell to a solution of 15% of HF acid concentration with period of 45 minutes, with a value of (12%) while the untreated solar cell efficiency was (8.1%). The Morphological Investigation shows that the etching rate is accretion with increasing of the treatment time, but after 45 minutes the first layer of the silicon solar cell was removed which caused declining in the efficiency, the nanosize of pores and the area expose to illumination.

Paper ID: 202

Important Factors Affecting the Microstructure and Mechanical Properties of PEG/ GO-Based Nanographene Composites Fabricated Applying Assembly-Acoustic Method

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Abstract. Graphene-based nanocomposites are one of the most important materials attracted the attention of researchers and engineers. This investigation focused on the effect of two considerable factors using the three molecular weights (Mw) 4k, 8k and 20k (g.mol-1) of polyethylene glycol (PEG) and reinforcing with low loading ratio of graphene oxide nanosheets (GONSs) on the mechanical properties of the polymer matrix. New developed sonication-mixing-aquatic methods were applied to synthesize the different MW of PEGs and PEGs/ GONSs nanocomposites then cast as films. Range of characterization was considered such as structural, rheological and mechanical properties. These were characterized using density and viscosity tolls, Fourier transforms infrared(FTIR), X-ray diffraction(XRD), opticalmicroscopic (OM) and ultrasonic. The FTIR results exhibited the most functional group of PEGs and GONSs, also confirmed the significant strong connection between PEGs with GONSs. Crystalline peaks of the PEGs were presented clearly in the nanocomposites using XRD, whereas GONSs peak was not clear showed that related to the full desperation of the GONSs in the samples as presented by OM. Most of the mechanical properties presented notable improvements with the increase of the molecular weights of net PEGsin the matrix and significant enhancements with the reinforcement of the GONSs, where the most characterizations such as, ultrasonic velocity, absorption coefficient and bulk modulesappeared a significant enhancements up to 50%, 700% and 126%, whereas the compressibility and relaxation time results were reduced to 75% and 54%. Moreover, the contribution of GONS with increase Mw of PEGs demonstrated an outstanding improvement of the mechanicalproperties up to 100%, 800%, and 307%, meanwhile the compressibility and relaxation time was reduced to 57% and 18%. Generally, increasing of the PEGsmolecular weights and reinforcing using GONSs led to notable enhancement in the properties of nanocomposites, where the sample contain higher molecular weight in both samples PEGs and PEG/ GONSs nanocomposites. From the obtained results the nanocomposite specimens perform good medium for transfer the ultrasound waves particularly in high molecular weights (20k), that means it presented good stability against and absorbance mechanical waves, therefore it could be applied for a coated material for objects that wanted to be invisible under sonar or in storage energy applications.

Paper ID: 203

Combining Polypropylene and Steel Fiber to Reduce Spalling of Reactive Powder Concrete Subjected to Fire Flame

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Abstract. The objective of the study was to investigate the spalling phenomenon in mixture fiber reinforcement Reactive Powder Concrete (RPC) exposed to fire according to standard curve ASTM E119. Steel fiber (SF) and polypropylene fiber (PPF) volume dosage are (2%, 0%), (1.5%, 0.25%), (1%, 0.5%), (0.5%, 0.75%) and (0%, 1%) respectively. The influence of fiber content with three different times of exposure (1, 1.5, 2) h on the mechanical properties were analyzed. The result for the investigational research is estimated to response the essential request whether if one of mixture type is susceptible to fire and avoid terrible failure of the full structure. The degradation of compressive strength, split-tensile strength, and flexural strength, ultrasonic testing analysis (UPV) were observed gradual with increasing duration of fire exposure despite the effect of different fibers. Steel fiber reinforced RPC (SFRPC),. Hybrid fiber reinforced RPC (HBRPC) with different dosage showed a ductile behavior .while PP fiber reinforced RPC (PFRPC) showed a quite brittle behavior specially up to 1.5 h. Hybrid fiber reinforced RPC was found to have better fire resistance than (SFRPC) and (PFRPC) and reduce the possibility of growth spalling.

Paper ID: 204

Analysis and Design of RC Wide Corbels - Suggested Procedure

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Abstract: What is meant by the wide corbel here is the corbel whose width (b) is more than two times its height (h).Wide Corbels are short cantilevers that stand out from inner face of wide columns or shear walls to support uniformly distributed loading that comes from wide beam. ACI 318-14 provisions allow the structural design of shear-controlled corbels through either shear friction (SF) method or the Strut-and-Tie modeling (STM). The current study presents analysis and design procedures using both SF and STM. Numerical examples for analyzing and designing one meter wide corbel are presented here in detail. It is concluded that the calculated load capacity using SF is 21% greater than that of STM. In other words, SF requires less reinforcement than STM by about 25%. That can be attributed to the difference in the safety factors that adopted by both approaches. More specifically, SF considers the main reinforcement as the reinforcement that resists moments, while STM considers it as the reinforcement that resists the direct tension of the formed tie. On the other hand, SF considers that the concrete and the horizontal stirrups resist shear, while STM considers that the shear is resisted by the formed inclined struts. The wide reinforced concrete corbel is designed here in the same way of the narrow one, but with some important differences. The main differences that were adopted in wide corbels are the applied load is a uniformly distributed load through the corbel width, repeating the frame reinforcement through the corbel width in order to hold the secondary reinforcement, and distributing the secondary reinforcement in a repetitive, overlapping and interchangeable way in order to ensure that the stirrups exist inside the entire corbel core.

Paper ID: 205

Analysis of Unsymmetrical Reinforced Concrete Double Corbels

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AbstractUnsymmetrical reinforced concrete double corbels have different shear spans (a) in each side. ACI 318-14 provisions allow the structural analysis and design of double corbels through either shear friction (SF) method or the Strut-and-Tie modeling (STM). The current study presents analysis procedure using both SF and STM. Numerical examples for analyzing unsymmetrical reinforced concrete double corbels with two different right to left shear span ratios (a_r/a_l = 3 and 2)are also presented here in detail. It is concluded that reducing a_r/a_l from 3 to 2 increases capacity by about 10.65% in case of SF, and 9.62% in case of STM. More specifically, in case of a_r/a_l=2-3, capacity calculated by SF exceeds that calculated by STM by about 23-24%. Finally, it is also concluded that the mode of failure dose not be the same at the both corbel sides, but in any case, the weaker side is the one who reports the failure.

Paper ID: 207

Effect of Seismic Load on Steel Frame Multistory Building from Economical Point of View

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Abstract. This paper aims at studying the effect of earthquake loading on the constructional design of a 13-multistorey steel frame residential building from economical point of view. This type of loading should be taken into considerations now in Iraq especially after the earthquake of 7.3 magnitude that occurred in November 2017 near the city of Halabja by about 31 kilometers. The same steel multistory building was designed twice; once with traditional gravity dead and live loading and the second with adding earthquake loading in order to discuss the difference from structural and economical points of view. A commercial package ETABS2018 was used to analyze this 39-meter-high building. The building was analyzed according to the American code ASCE7-10, while it was designed according to AISC 360-10. A huge increase in the steel member amounts in columns, beams, secondary beam, deck slabs were recorded due to taking the seismic load into considerations. More specifically, the steel frame amounts increased due to including earthquake loading, the addition in steel frame section (p-m) interaction ratio was by about 209% and 128% for columns and beams, respectively. Therefore, cost was raised by about 209% and 128%, for columns and beams, respectively. More specifically, the total cost of the building concerning beams and columns increased by 337%. It is worth to mention here that the maximum increase in main steel frame was observed on the storey 10. Whereas, in slabs, the maximum increase that was recorded in main ratio of (p-m) interaction increase was occurred from the storey 8 to the building top. In columns, the main ratio of (p-m) interaction increase was seen on the 8ht, 9th, 10th and 11th storeys due to effect lateral shear forces, and section is not seismically compact for highly ductile members (AISC 341-10 Table D1.1).

Paper ID: 209

Behavior of Concrete Containing Waste Iron and Crushed Igneous Rocks Modifying With Waterproof Admixture and Polymers

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Abstract: This study tries to focus on some of the mechanical properties of concrete containing recycled aggregate which uses waste iron as fine aggregate and waste gabbro rock as coarse aggregate. They replacement of two materials are from 0% to 100%. This study also demonstrates that the compressive strength increases from 40.2MPa to 51.8MPa at 75% replacement of fine and coarse aggregate and the flexural strength increases from 3.1 to 8.9MPa. Furthermore, it was found that less absorption for the concrete obtained using recycled aggregate because of less voids in such concrete and that means high durability concrete in same time and that attributed by high durable igneous gabbro rock. This rock has high density, strength and hardness and also very low water absorption. The study also includes modifying waste aggregate concrete with waterproof admixture and styrene butadiene polymers which increased the strength and decrease the absorption especially after 75% replacement of coarse and fine aggregates.

Paper ID: 210

Construction of Optical Fiber Humidity Sensor by laser Technique

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Abstract. In this paper we propose humidity sensors by using two kinds of optical fibers: single mode and multimode optical fibers. The two sensors were coated by a hygroscopic polymer (sodium silica) which is sensitive to the changes of humidity in order to enhance the sensor's sensitivity. The presented sensors were experimentally tested over nearly the same range for the purpose of comparison. The single mode fiber humidity sensor with 0.045 nm/%RH sensitivity was better than the multimode one which gave 0.036 nm/%RH sensitivity.

Paper ID: 211

Preparation and characterization of InN NPs by laser ablation in ammonium solution

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Abstract. Nanoparticles NPs of Indium nitride InN has been prepared in a one-step laser technique using nanosecond pulsed laser ablation for indium specimen placed in ammonia. Morphological, vibration bond and optical properties of these NPs were examined using a scanning electron microscope, Fourier transforms infrared spectroscopy and UV-VIS-NIR spectroscopy. FTIR spectra demonstrate the existing of In-N and In=N vibration bonds. SEM result shows that nanoparticles with a spherical-like shape and sizes in a range of (5-40) nm. The UV-VIS-NIR spectrum has broadband with a bandgap about 1.8eV. For optoelectronic applications, the InN suspension NPs were deposited on porous silicon using a drop-casting technique. The heterojunction of InN/PS/Si has good response at 750nm which about 1.38A/W.

Paper ID: 212

Indirect Spectrophotometric Methods for Determination of Paracetamol in Pure Form and In Its Pharmaceutical Preparations

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Abstract. Easy, fast and economical methods were used for estimation of Paracetamol (PAR) in both pure form and pharmaceutical formulations. These methods depend on oxidation of (PAR) In the acidic medium there are known amounts of oxidizing agent "KBr:$KBrO_3$", the remaining (unreacted) amounts interact with: (A) Phenosafranine (PS) dye [**3,7-**Diamino-5-phenylphenazin-5-ium chloride**]** to produce "red product" at $\lambda_{max.}$ 520 nm. Linearity was at the range of concentrations (6-72) µg/mL and molar absorptivity 2.434×10^3 L/mol.cm, correlation coefficient 0.9993 and the limit of detection 0.443 µg/ml.(B) Crystal Violet (CV) dye [4 [bis [4 (dimethylamino) phenyl] methylidene] cyclohexa-2,5-dien-1-ylidene]-dimethylazanium;chloride to produce blue product at $\lambda_{max.}$ 634 nm. Linearity was at the range of concentrations (15-175) µg/ml and molar absorptivity 1.073×10^3 L/mol.cm, correlation coefficient 0.9993 and the limit of detection 0.346 µg/ml. These proposed methods have been successfully applied to estimate Paracetamol in pharmaceutical form of tablets

Paper ID: 213

Biostimulation Effect of DPSS Laser Irradiation with Different Power Densities and Radiation Times on Blood Viscosity in Vitro

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Abstract. Biomodulation by low level laser Irradiation (LLLI) has become prevalent as a therapeutic method through the improvement of blood microcirculation as well as inflammation. It is not understanding till now the evidence for this kind of application. This study was intended to assess the effects of DPSS (Diode Pumping Solid State) laser radiation on blood viscosity (an erythrocyte aggregation index) in vitro and examined the effect of changing radiation time and power density on blood viscosity as well as find the best doses. A blood of 12 healthy volunteers were collected by venipuncture into anticoagulant tubes containing EDTA. Yellow DPSS laser light of 589nm wavelength in continuous wave, as a radiation source was used. Each sample was separated into five equivalent aliquots to be utilized as irradiation samples and control samples (without radiation). The RBCs counts values are checked before and after laser irradiation. The comparison results showed high significant($P<0.01$) alteration at power density 26 mW/cm² and radiation time 25 min, while the other comparison results did not show significant differences ($P>0.05$) in value of blood viscosity. The optimal dose value was noticed at 39 J/ cm² for the irradiated blood when compared with control blood samples. It can conclude that the reduction on blood viscosity by DPSS laser depend on changes of irradiation duration more than changes of power densit

Paper ID: 217

SEM-EDX and ATR-IR Studies of theMechanistic Insight into Efficient Removal of Chromium (VI) from Aqueous Solution by Very Small Surface Area Contained Adsorbent

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Abstract. In this study, we present a new mechanism of enhanced adsorption of Cr(VI) by Dust Black Tea Leaves (DBTL) as a very small surface area contained adsorbent. Generally, adsorption is a surface phenomena; higher the surface area –larger the adsorption capacity. But in this case, reverse phenomenon was observed from the analysis of adsorbed surface by Scanning Electron Microscope (SEM), Energy Dispersive X-ray (EDX) and Attenuated Total Reflectance Infra-Red (ATR-IR) spectrometer. The SEM micrographs of Cr(VI) adsorbed DBTL at different magnifications provided the granular arrangement of chromium on DBTL surface which was confirmed by the EDX analysis of such granular arrangement on DBTL surface. The point analysis of Cr(VI) adsorbed DBTL surface by SEM-EDX elucidated the real picture of the large amount adsorbed at the cavity of the heterogeneous surface of DBTL, which leading to the enhanced adsorption on small surface area. ATR-IR spectrum of Cr(VI) adsorbed DBTL indicated the interaction of protonated functional groups of cellulose in DBTL with chromium at low pH of solution, which was also intensified the adsorption capacity, irrespectively to the surface area. Fully recovery of adsorbed chromium from DBTL surface by chemical treatment also supported the above observation

Paper ID: 219

Calcium Oxide Nanoparticles Effect on the Initial Caries Remineralization

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Abstract. Enamel is the exterior stratum of the anatomical crowns of teeth. It is a solid, scanty and glassy layer of a calcified matter that wraps and shelters the dentin. In the oral environment when the pH is beneath 5.5, calcium and phosphate ions are discharged away from the enamel in a procedure admitted demineralization. Calcium oxide (CaO) is an inert mixture that is accustomed in different attentions as a poison-waste remedy actor, catalyst, adsorptive, etc. The study, evaluate the effect of CaO nanoparticles in the remineralization of initial caries and the adjacent sound area. samples of enamel were prepared from molar teeth involve the initial caries area and the adjacent sound area to be studied by scanning electron microscope pre and post-application of coating materials. The statistic analysis showed an increase in calcium and a decrease in phosphorous ions post-treatment. This indicate that coating the initial caries of enamel with CaO nanoparticles increase the remineralization.

Paper ID: 220

Optimization of Dry Sliding Wear Performance of Polyamide 66 and Their Composites Using Taguchi Approach

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Abstract. The present study considered the specific wear rate for polyamide 66 and their composites prepared by injection technique. The experimental tests are achieved under dry sliding conditions at room and elevated temperatures using Taguchi approach with (L_{27}) array. The material type, normal applied load, sliding time, and temperature are adopted as design parameters while, the specific wear rate adopted as the response. The optimal design parameters values for minimum specific wear rate are found by Taguchi approach. It's found that the combination of PA66+30%CF, 10 N applied load, 10 min sliding time, and 20 °C test temperature are the optimal design values for minimum specific wear rate. The results appeared that the specific wear rate is greatly influenced by the increase in applied load, sliding time, and temperature; on the other hand the addition of reinforcement materials (short carbon fiber or carbon nanotube particles) leads to increase the wear resistance. The most effective factor on specific wear rate is the applied load and followed by material type, temperature, and sliding time.

Paper ID: 221

Synthesis and Catalytic Activity Studies of α-MnO_2 Nanorodes, Rutile TiO_2 and its Composite Prepared by Hydrothermal Method

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Abstract. α-MnO_2 exhibits an excellent catalytic activity in different chemical reactions, functions as enzyme alternative, as so-called artificial enzyme which is used in different applications such as industrial, environmental and biological applications (antibacterial activity). The current study, reports the synthesis of α-MnO_2 and rutile TiO_2 nanostructures using hydrothermal (autoclave) method by using precursors such as potassium permanganate ($KMnO_4$) and titanium tetrachloride ($TiCl_4$) respectively. The annealing of α-$MnO_2$was carried out between the temperature range 250-700˚C. For the characterization of synthesized nanostructures i.e. surface and structure morphology was done through Atomic Force Microscope (AFM), X-ray diffraction (XRD), thermal analysis, Scanning Electron Microscopy (SEM), and molecular spectroscopic measurements. A novel colorimetric method was applied to study the catalytic activity for α-MnO2 which measured the gradual reduction in color density after reaction of KMnO4 solution or MnO_2 nanoparticles with hydrogen peroxide (H_2O_2) at normal room temperature. The results indicated that α-MnO_2 nanopowder showed the maximum activity at annealing temperature of 400 ˚C. The composite of MnO_2-TiO_2 in the ratio of 3:1 when annealed at 400 ˚C showed the decrease in catalytic activity in the decomposition reaction of H_2O_2 as compared to that of pure α-MnO_2nanopowder.

Paper ID: 222

Mechanical Properties of 27Cr- White Cast Iron Subjected To Sub-Zero Heat Treatments

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Abstract. High-chromium white cast iron types are used extensively in applications that require good wear resistance such as mills liners , drills …etc , hence these irons are subjected to wear ,erosion and impact that cause failures sooner than expected. So it is required to enhance their hardness , erosive wear and toughness This study aims to clarify the influence of sub-ambient heat treatment on the microstructure, toughness , erosive wear resistance and hardness of high chromium white cast iron (category A-532 Class III Type A). In this study, the specimens were austenetized at 950°C for one hour , one group was air quenched for two hours and the other group was quenched in molten nitrate salt at about 350°C for four hours and air cooled. Then the two groups were sub-ambient treated successively with three types of cold mediums (domestic freezer, dry ice, and liquid nitrogen) each for 24 hours. After comparing the results of hardness, toughness and erosive wear of sub-ambient treated specimens with the annealed specimens it is found that the hardness is decreased, toughness of air quenched group showed further increment as compared with the nitrate quenched group. The erosive wear resistance generally was enhanced with increment of 90.74 % in sample(air quenched+ liquid nitrogen followed by tempering LN*T) despite their lower hardness as compared with annealed sample. This result lead to make a new assumption that the hardness values is not always considered as an indication to wear behavior

Paper ID: 223

Transfer Factor of Natural Radionuclides from Soil to Silhouette Plants using gamma spectroscopy

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Abstract. The Silhouette plants samples were collected from various nurseries in Baghdad to study the activity concentrations of natural radionuclides, K-40, Ra-226 and Th-232 in addition to Radon Adsorption percentage for the first time in this research to Plants and soils with the transfer factor from soil to plant using NaI(Tl) detector. It has been classified two groups of plants; unirradiated group (control group) and irradiated group at which the plants are subjected to the radon emitted plant from the radium sources. The results show that the average activity for Bi-214 of irradiated samples was 10.9±3.1Bq/kg which is higher than that unirradiated samples 8.3±2.5Bq/kg and the average activity of irradiated soil samples was 13.4±3.9 Bq/kg alsoits higher than the specific activity of unirradiated samples 10.1±2.8Bq/kg. It found that the mean of the transfer factor are 1±0.2, 0.7±0.2, and 0.8±0.2 respectively before irradiation and 1.06±0.3, 0.72±0.2 and 1.4±0.7 respectively after irradiation. The highest value of the radon adsorption was in the Yucca elephant plant, while the lowest radon adsorption was in the Syngonium plant. This indicates that the silhouette plants have characterized by their ability to adsorbed radon gas and recommended to reduce its presence inside homes and buildings.

Paper ID: 224

Optimization of Surface Integrity in WEDM of Al/WC_p Metal Matrix Composites Using Grey Relational Analysis

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Abstract. Demand for low weight to strength ratio for specific application in aerospace components and automobile created a field for advance studies on Metal Matrix Composites (MMCs). The main response selected to evaluate the processes are white layer thickness (WLT) and surface crack density (SCD), whereas the corresponding machining conditions are discharge current (I_p), voltage (V), pulse on time (T_{on}) and pulse off time (T_{off}). Wire Electrical Discharge Machining (WEDM) process is principally with multi response, thus Grey Relational Analysis (GRA) is especially adopted to decide the optimum combination of machining parameters of Al6061 reinforced with volume fraction of 10% WC_p. Design of experiments was carried out based on a standard L_{27} orthogonal array of Taguchi method. Minitab16 software was performed to analyze the results obtained from experimental runs at confidence level 95%. For the present experimental study, it is observed that WLT and SCD are mainly affected by all process parameters except T_{off} has little effect on the SCD. The values corresponding to the response parameters were calculated using mathematical formulas and confirmed by the verification experiment. The values of confirmation tests, all being found to be quite satisfactory (10.92 % in the worst case), prove the efficacy and reliability of the suggested approach.

Paper ID: 225

Preparation and a new method to determinate catalase mimics activity of MnO_2, Fe_2O_3 and MnO_2:Fe_2O_3

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Abstract. A new colorimetric method was used to determine catalase mimic activities of MnO_2 nanoparticles against hydrogen peroxide (as substrates), by using a new method (acidic solution of potassium permanganate). Manganese dioxide (MnO_2) and iron oxide (Fe_2O_3) nanoparticles were prepared by a hydrothermal method. We annealed MnO_2 at different temperatures (250-700˚C). MnO_2: Fe_2O_3composite were prepared in the mole ratio of 3:1 the annealed at 400˚C. The structures of these nanoparticles and the surface morphology were characterized by FT-IR measurements, X-ray diffraction (XRD), Scanning Electron Microscopy (SEM), and Atomic Force Microscope (AFM). Our results found this new method succeed to determine catalase mimic activity and the annealing at 400˚C is the best sample activity of MnO_2, while the catalase mimic activity of the composite was decreased compared with MnO_2 activity alone in the same annealing temperature.

Paper ID: 226

Analysis of Circular Plasmonic Photonic Crystal Fiber for Filter Applications

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Abstract. A simple design of circular photonic crystal fiber (CPCF) filled with plasmonic nano rods is presented. The polarization characteristics and spectral losses of the proposed layout are examined using the Full - Vectorial Finite Element Method (FV-FEM). The reported design has the advantage of: highly form surface plasmon polariton (SPP) modes and highly polarization-dependency between the two guided quasi-modes. The polarization features of the CPCF can be enhanced by stuffing the air hole cladding with several nano rods. The reported novel structure can be used for filter design. It is found that at $\lambda = 0.85$ μm, the quasi-TE mode loss is equal to -10.02 dB/mmwhereas it is only –15.01 dB/mmfor the single metal rod TM mode. On the other hand, the incensement of the losses for double nano rods is equal to-69.21 dB / mm for quasi-TE mode and -14.19 dB / mm for quasi-TM mode at $\lambda = 0.8$ μm.

Paper ID: 227

Reinforced Concrete Continuous Deep Beams under the Effect of Different Parameters

Khattab Saleem Abdul-Razzaq[1], Ali Mustafa Jalil[2] and Asala Asaad Dawood[3]

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Abstract. Most codes of practice, like ACI 318-14, 9.9.1.3, require the use of strut-and-tie modeling (STM) to deal with reinforced concrete continuous deep beams (rc-cdbs). Though, investigations that conducted on rc-cdbs did not include all the most influential parameters. This work presents an analytical parametric study using STM stated by ACI 318-14 to calculate load capacity of 20 rc-cdbs with different parameters. The parameters took into consideration in the current work are shear span to overall depth ratio (a/h), width of beam (bw), width of bearing plate (BP), concrete compressive strength (f'c) and amount of vertical shear web reinforcement (*pv*). It is seen that the load capacity decreases by about 14% to 37% when a/h increases by about 33% to 100%. It is also seen that load capacity increases by about 33% to 100% when bw increases by about 33% to 100%, while the load capacity increases by about 10% to 30% when BP increases by about 33% to 100%. Finally, it is found that load capacity increases by about 35% to 100% when compressive strength increases by about 35% to 100%, while the load capacity increases by about 0% to 25% when *pv* increases by about 33% to 100%.

Paper ID: 228

Ring Deep Beam – A Parametric Study

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Abstract. Most codes of practice, like ACI 318-14, require the use of strut-and-tie modeling to analyze and designreinforced concrete deep beams. Though, investigations that conductedondeep beams do not include ring deep beams of influential parameters. This work presents an analytical parametric study using strut-and-tie modeling stated by ACI 318-14 to predict load capacity of 20 reinforced concrete ring deep beam specimens with different parameters. The parameters that were under consideration in the current work are ring diameter (*Dc*), number of supports (*NS*), width of ring beam (*bw*), concrete compressive strength (*f'c*) and width of bearing plate (*Bp*). It is found that the load capacity decreases by about 14-36% when ring diameter increases by about 25-75%. It is also found that load capacity increases by about 62-189% when number of supports increases by about 33-100%, while the load capacity increases by about 25-75% when the beam ring width increases by about 25-75%. Finally, it is found that load capacity increases by about 24-76% when compressive strength increases by about 24-76%, while the load capacity increases by about 5-16% when *Bp* increases by about 25-75%.

Paper ID: 229

Preparation, Characterization and H_2 storage capacity of Newly Mn(II), Co(II), Ni(II), Cu(II) and Zn(II) Mixed Ligand Complexes of Paracetamol and Saccharine

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Abstract. The study includes the synthesis of new paracetamol- (Par) and saccharine- (Sac) containing complexes with the elements; Mn (II), Co (II), Ni (II), Cu (II), Zn (II). These complexes are characterized by elemental analysis (C.H.N), molar conductivity, electronic spectra (UV-Vis), Fourier transform infrared spectroscopy (FTIR), nuclear magnetic resonance (1H-NMR) and magnetic susceptibility. Based on these measurements, complexes are found to be in the type $[M(Par)_2(Sac)_2(H_2O)_2]$; where M (Ni) II, Co (II), Cu (II), Zn (II), Mn (II) with octahedral geometries. Furthermore, the results demonstrate that both Par and Sac ligands act as mono-dentate ligands through oxygen and nitrogen respectively. Additionally, the susceptibility of a Cu complex to hydrogen uptake was examined after its surface area was investigated by measuring nitrogen adsorption- desorption isotherm. The result proved that this material has good storage capacity but under high pressure.

Paper ID: 230

Graft modification of PVC with 1,2,4-triazole ring system for preparing flexible PVC materials

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AbstractA compound was prepared and its structure was investigated by FTIR and HNMR spectroscopy. Schiff base was grafted on PVC chains to get flexible PVC. The chemical modification of PVC with (L) prepared to make a homogenous polymeric mixture. PVC-L-Cu(II) has been produced by adding PVC-L to copper chloride. Polymeric films had been exposed to UV light 300 hours and investigated by FTIR, weight loss percentage and SEM.

Paper ID: 231

Effect of Thermal and Natural Particles Addition on the Mechanical and Physical Properties of Blend Polymer

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Abstract. Natural particles were mixed with polymer resin in this study. Walnut shells as a particles were used to create a composite material that was added to a binary polymer blend matrix, namely, epoxy/polyurethane (PU). Liquid PU was added to epoxy at a volume ratio of 15%. Furthermore, temperature (20 °C–50 °C) and the walnut shells particles (WSP) with volume fraction of (2.5%, 5%, 7.5% and 10%) were used to assess the mechanical and physical attributes of the material, hardness, impact strength and thermal conductivity. According to the findings, when temperatures were high, there was an increase in impact strength and a decrease in the hardness and thermal conductivity values. Meanwhile, an increase in the volume fraction of WSP caused an increase in hardness and impact strength and a decrease in thermal conductivity.

Paper ID: 233

Bio-Sensing Simulations Using HC-PCF Filled with Different Bio-Liquids

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Abstract.A finite element analysis using COMSOL Multiphysics for simulation of photonic crystal fiber (PCF) as biosensors. Two types of the hollow core-photonic crystal fiber (HC-PCF) are used HC19-1550 and HC-1550 overfilled with various bio-liquids (pentanol, liverblood, colon blood and epidermisblood). In the present work, we make numerical calculations of effective refractive index, amplitude sensitivity, effective mode index and the confinement loss of the fundamental mode for empty and filled PCF with different bio-liquids and for two types of PCF. Our results show that as therefractive index (RI) the effective mode index increases and the minimal value of confinement loss decreases and shifted to smaller wavelengths for the two types of PCF, which allow us to calculate the PCF amplitude sensitivity. The wavelength shift can be determined using the index scaling law for the two kinds of PCF as a function of refractive index.

Paper ID: 234

From in situ investigation to FEM analysis: Application of Al-Hadba minaret foundation

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Abstract. Recently, the historic buildings in the old Mosul city-northern Iraq, were devastated. Since these buildings represent a precious value, maintenance, rehabilitation, preservation, and management becomes inevitable. The current research discusses the possibility for reviving the historical Al-Hadba minaret, more than eight and a half centuries. The study adopted to achieve this goal by treating the weak soil layers surrounding the minaret foundation. The treatment follows two different techniques: the first is to treat the soil layers by cement-grouting technique, while the second one includes the installation of micropiles beneath the minaret foundation. The research work included the use of a 2D model of the Finite Element Method in the analysis, thanks to PLAXIS software to achieve the planned targets. The study concerned in comparing the analysis of soil-stress distribution before and after the treatment in order to reach the optimal decision which can be adopted in future works to rehabilitate the minaret. Also, the study gave great attention for analysing the total vertical displacement of the foundation, the soil bearing capacity and the safety factor of the minaret integrity. The study concluded that there is a marked improvement in the performance of treated soil layers, which leads to increase the minaret stability. The cement-grouting technique gives better soil layers performance compared with the installation of the micropiles.

Paper ID: 235

Modeling of the Aerodynamics of the Integrated Four Blades (VAWT) Having Movable Vanes

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Abstract. One of the economic problems facing all the public at present is the increasing demand for energy. Because of industrial development, fossil fuel depletion is on the increase, so the use of renewable energies as an alternative to fossil fuels has become apparent. In addition to solving problems caused by fossil fuels on the climate. Wind power is one of the most important renewable energies; the wind turbine is the machine that converts wind energy into mechanical energy. Which is used to pumping water, grind grain and generate electricity. The aim of this work is to study the aerodynamic performance by using Computational Numerical Simulation CFD of a model of a vertical axis wind turbine has four integrated blades (each of which consisted of a vertical movable vane with Darius-type airfoil). The objective from combined the airfoil with the vanes comes to solve the low starting torque of the airfoil. (SST) k-ω turbulence model and finite volume method were used with ANSYS FLUENT 16.1 software's. The results concluded from the present numerical simulation gives that the drag coefficient Cd is in maximum value at the positive side at 90° angular position, and Cd is decreased to the minimum value in negative side at 45° angular position. The drop in the static pressure in the positive side is higher than on the negative side. The aerodynamics characteristics results represented by the static and dynamic pressures distributions and velocity distribution show that the air exerted to the turbine blade on the negative side is easily passes without any resistance. Therefore, it can be conclude that the addition of the vertical movable vanes with straight airfoil in one construction of a vertical wind turbine blade helps to solve the Darrieus straight airfoil starting torque and increases the rotation of the turbine rotor. The result gives is agreement with that of published studies.

Paper ID: 236

Comparative Performances of Modified Push-out Segments with Through-Depth Two-End Welded and Thread-Tightened Stud Shear Connectors

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Abstract. The prime objective of this research is to investigate and evaluate the profound enhancement in performance of modified push-out segments, simulating the steel-concrete-steel sandwich construction, when the two ends each through depth stud are welded as a replacement of threaded-tightened technique. Three push-out segments each comprising a concrete slab sandwiched between two steel tubes and interconnected by stud along the whole thickness of the concrete slab and welded to both steel tubes, were examined to be more compatible than the standard test in representing the double-skin beams. The segments were tested under the effects of changing the shear connectors cross-sectional areas, and the ultimate shear resistance, associated slip, shear stiffness, and the energy absorbability were determined. Afterward, a comparison in the upto failure performance and values of the three specified mechanical properties is made, from which the privilege of the welding technique of the two stud ends, over the competitive threaded-tightened technique has been verified.

Paper ID: 237

Study the Effect of Calcium and Nano Al_2O_3 Oxide Powders on the Mechanical and Physical Properties of Cement Mortar

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Abstract. The concrete is the major construction materials, the concrete have impact on environment because the production of concrete composition material (cement, sand, and coarse aggregate) lead to depleted natural resources and emitted CO_2 .Therefore; in this study two types of eggshell is prepared, three different percentages of eggshell (2.5, 5, and 10%) and 1% nano-materials(nano-Al_2O_3) are added to partial replace of cement weight in the cement mortar to reduce the cement environment impact and their effect on the mechanical (compressive strength) and physical (density , and water absorption) properties are investigated. The results shows when add the eggshell to the cement mortar the compressive strength are increased up to 5% of eggshell then decreased, while the density , and water absorption of cement mortar are decremented with addition 2.5% of eggshell. The combine effect of nano-Al_2O_3, eggshell powder and nano-Al_2O_3, calcined eggshell powder are decreased the compressive and density, while the absorption percentage is increased compared with nano Al_2O_3 cement mortar(NA) .

Paper ID: 238

New Nanocomposites (PMMA-SPO-SiC) Fabrication and of Their Structural And Electrical Properties for pressure Sensors

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Abstract. New nanocomposites (PMMA-SPO-SiC) prepared by adding nanoparticles of silicon carbide to poly methyl methacrylate (PMMA) and ethylene alpha olefin copolymer (SPO) with distinct percentages (0, 0.005 , 0.01 , 0.015 and 0.02) wt A.C electrical conductevity (σac) improves with growing levels for Silicon Carbide (SiC) and frequency (F). D.C electrical conductevity (σdc) improves with growing Silicon Carbide (SiC) levels and temperature (T). Dielectric reduction and dielectric variables (έ) reduce as Silicon Carbide (SiC) nanoparticles increase. The activation energy (Eact) reduces as Silicon Carbide (SiC) nanoparticles increase. The implementation for pressure sensors Electrical resistance demonstrated of (PMMA -SPO-SiC) nano-composites declines Pressure increased..

Paper ID: 239

Effect of Few-Mode Fiber Profile on Long-Haul MDM Transmission

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Abstract. The efforts for higher spectral efficiency have increase interests in a mode division multiplexing (MDM) systems. However, sensitivity of MDM to modal crosstalk and fiber nonlinearity (leading to nonlinear phase noise) forms the main penalty. Therefore, few-mode fibers (FMFs) are designed to guide a few modes in MDM transmission. In this paper, a numerical analysis is established to estimate the transmission performance of three different kinds of few mode fibers (FMF) that can be realized in long-haul MDM systems. The fibers, namely step index-FMF (SI-FMF), graded index-FMF (GI-FMF) and transversal index-FMF (TI-FMF), are designed to carry three spatial modes. In order to explore the MDM performance, LP01, LP11a and LP11b modes are modulated with 4QAM format at 10 Gsymbol/s and sent into the fibers. Multiple-input multiple-output digital signal processing is utilized for compensating modal crosstalk. The results reveal that the signal quality that transferred by LP11 mode over GI- or TI-FMFs is substantially improved as compared to LP01 mode over entire transmission distances. However, SI-FMF fiber enables LP01 mode to transport signal with higher quality than LP11a and LP11b mode in long-haul 4QAM MDM transmission.

Paper ID: 240

Recycling the Waste of Paper into Usable Board

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Abstract. The recycling of waste paper conserves our natural resources and will retrieve environmental quality. Concentrate on recycling waste paper into the usable board will benefit plants and the environment. This research depends on the investigation of manufacturing of usable board from waste paper. This manufacturing board can use instead of the board which manufactures from ordinary wood. On the other hand, it protected the forest and eliminates waste that harms the environment. This research illustrates the efficiency of our manufacturing board material by using mechanical tests and comparing it with a board manufactured by two types of ordinary wood and Medium-density fiberboard (MDF). Also, comparing the heat isolation between them. In this project, we use three types of waste paper: white, yellow envelope and newspaper. This waste paper produced our new board material. Our samples were manufactured with dimensions of 10*10 cm and 2 cm thickness. Different amount of waste paper and white glue was investigated to produce a batter board. Our study for the manufactured board materials demonstrated that a white paper sample was the battery on hardness and tensile test. However, yellow envelope samples were more efficient in the impact test than other samples. Moreover, yellow envelope samples were the better one between our samples in heat isolation. Mainly, the waste of paper and white glue was the cheapest to manufacture boards than using ordinary wood.

Paper ID: 242

Fabrication, characterization and some mechanical properties of Graphene –kevlar epoxy hybrid.

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Abstract. The present study aims to investigate the aptitude of graphene inclusion effects on impact strength and hardness characteristics of kevlar fiber reinforced hybrid composites. There is a requisite for emerging new industrial procedures to fabricate polymer improved with nanomaterial for requests where weight, stiffness and strength. Graphene was equipped by "oxidation of graphite" fragments and characterized bymicrowave techniques. Graphene and Kevlar fibers independently bargain a very extensive field of applications because of their various mechanical properties. Graphene/ kevlar the hybrid laminates epoxy composite were made-up by a dry hand layup technique with 25% volume fractions."Impact strength (I.S) and hardness shore (D)" were examined in accordance with ASTM standards. Structure and morphology were tested using XRD and FESEM. The x-ray spectrum shows that the pattern of the particles formed have peak (001), rang of crystalline size between (17-6 nm). The test results show a considerable improvement in impact strength and hardness values with an increase of graphene/kevlar content in the composite increased. Interfacial surface area treatment of fiber reinforcements with nanoparticles, on the other influence could expand in possessions of" laminated composites", even as interfacial adhesion.

Paper ID: 243

Preparation Iron oxide nano Powder in 20 Minute

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Abstract. In this work, we prepared magnetic nano particles in format (Co_xZn_{1-x} Fe_2 $O_{4)}$. The method used is microwave-assisted combustion with type of fuel, glycine. This method is characterized via the rapid acquisition in nanoparticles with a boundary of (30-12 nanometers) in 20 minutes. Structure and magnetic properties were tested using XRD, FESEM, FTIR, and finally the Vibrating Sample Magnetometer (VSM), which revealed the presence of Super para magnetic samples. The x-ray spectrum shows that the pattern of the particles formed is of the face -centered cubic and the theoretical values of the lattice constant and crystal density (dx) and crystalline size (D) are calculated. The FTIR spectrum shows two absorption bands ranging between 400 and 600 cm-1. These bands indicate that the composition of the spectrum for all the samples is ferrite.

Paper ID: 244

Energy Saving in Iraq: Waxes as Phase Change Materials for Space Heating

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Abstract. Space heating is one of air-conditioning sectors that consumes a huge amount of the electrical energy supplied to the house and has a major impact on emissions of greenhouse gases and corresponding global warming. Phase change materials (PCMs) are regarded as a possible solution for reducing the energy consumption of buildings by storing the heat and releasing it in certain times. The present study assists for the utilization of waxes as PCMs by attaching an enclosed space to the roof of the building where the wax is exposed to high solar intensity in order to melt, and then circulating the warm air to the room overnight for heating. Building considerations as well as thermo-physical properties of waxes have been taken and measured experimentally. Results have shown that these materials have a good potential for reducing energy demand and satisfy comfortable thermal conditions. The obtained results, from a rig model built for that purpose, showed that the indoor temperature with the using of waxes could increase by 3-6 ^{o}C at winter nights compared to that measured in a traditional one. Furthermore, a simulation program depended on degree-days method explained that the energy consumption could be saved up to 67%. In other words, waxes could submit encouraging suggestions to enhance the heating for energy efficient buildings and offer sustainable solutions.

Paper ID: 245

Viscosity Reduction of Iraqi Crude Oil by Different Additives

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Abstract. The high viscosity of heavy oil is a crucial factor that strongly affects its up-stream recovering, down-stream surface transporting and refining processes. Economical methods for recovering the heavy oil and reducing is very important and related to capital and/or operating cost. This research studies the treatment of Iraqi heavy crude oil, which characterize with high viscosity and low API which makes transportation of heavy crude oil a difficult mission, needs for treatment to reduce viscosity for facilitating transportation and processing. Iraqi heavy crude oil was used Sharqi Baghdad, which obtained from Baghdad east oil fields with API 22.2º.Many kinds of additives were used to reduce the viscosity, experiments were performed on the heavy oil sample using different solvents (Ethanol, n-Propanol and methyl ethyl ketone (MEK)). Among all the types used, the MEK was found most efficient viscosity reducer of heavy crude oil, the maximum viscosity reduction reached to 3.78 cSt at 75^{o}C and 26 API at 25^{o}C while the other solvents for n-Propanol 5.85 cSt at 75^{o}C and 24.61 API at 25^{o}C while for ethanol 5.96 cSt at 75^{o}C and 27 API at 27^{o}C

Paper ID: 246

Preparation of activated nano charcoal fromPomegranate peel and use it to adsorption drug methylene blue from aqueous solution

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Abstract. This study targeted to evaluate the availability of extraction the nano-activated carbon from pomegranate peel and study its adsorption efficiency for methylene blue of water solution. UV-Vis is used to know the adsorbent quantities. The results showed that better concentration for adsorbent material was $0.15*10^{-4}$ molar, better weight for activated carbon was 0.005g and equilibrium time was 45min. In this study, used largergreen equation for pseudo first order and pseudo second order. The results showed that adsorption system was pseudo second order. Also, in this study applied isotherm, freundlich and Langmuir models and results showed very good linear relationship and relationship coefficient.

Paper ID: 247

Comprehensive Study of Generating Sharp Dip Using Numerical Analysis in Prism Based Surface Plasmon Resonance

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Abstract. Surface plasmon resonance is a valuable tool and widely applied in many fields recently. This approach will focus on enhancing a sharp dip of the reflectance curve by using surface plasmon resonance. The reflection light from prism-based was simulated depending on the thickness and number of plasmonic layers. The addition of the air gap between the two layers of the same and different plasmonic materials optimizes the sharpness of the reflection curve. The sharpness of the reflection curve was examined for accuracy and sensitivity at 632 nm and 1550 nm in triple layers design and compared to the single-layer design. The result shows that the triple layers have higher accuracy than a single layer and also higher at 1550 nm compared with 632 nm. The result also compared with sensitivity at both wavelengths. The sharpness of the resonance curve will help to specify the resonance dip of the reflection SPR curve. The new design investigation was based on the air gap, variation of the thickness, and the type of plasmonic material.

Paper ID: 248

Employing the Artificial Neural Network to PerformSeepage and Slope Stability ofEarth DamwithToe Filter

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Abstract. This research is based on the use of the artificial neural network model, with associated with the Geo-Studio results to show the effect of the amount of seepage discharge inside the body of the earth dam having a toe filter, in addition to estimate the amount of the factor of safety for upstream slope. The study consisted of two flow patterns; steady state flow, and unsteady state flow in upstream head level. The best neural network model was obtained to represent output models for both flow types, and having high degree of accuracy. Nonlinear regression equations were also proposed to calculate the discharge amount and the factor of safety for models of steady and unsteady flow.

Paper ID: 249

Influence of laser pulse on properties of NiO NPs prepared by laser ablation in liquid

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Abstract. In this work usede pulsed laser ablation in liquid to produced congenial nanoparticles, is a direct, precision and easy method.A quasi like spherical NiO NPs were utilized a 1064nm Nd:YAG laser, working with 700 J/pulse and altered number pulses (50, 100 and 150 pulses). Impacts laser pulses on the features of NiO NPs were been deliberated briefly. FTIR spectra resemble the establishment of Ni-O band. The concentration of NiO nanoparticles increased when the number of laser pulses increased. The optical absorption exhibit a blue shift when the number of laser pulses decreased, with gaps are changing from 3.65 to 3.8 eV depending on number of laser pulses.

Paper ID: 250

Preparation of Nickel Oxide Nanoparticles Prepared by Laser Ablation in Water

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Abstract. Quasi-spherical Nickel oxide based nanomaterial was prepared utilized Nd: YAG laser and different laser energy (500, 600 and 700 mJ/pulse). Powers of laser parameters on the characteristics of NiO nanomaterial prepared using laser ablation in water have been discussed briefly. FTIR measurements conform to the formation of the Ni-O band. The result of the optical absorption exhibit shifted to smaller wavelength, as the laser energy decreased. The transition has direct with band gap are (3.65- 3.8) eV rely on laser energies.

Paper ID: 251

Comparison Study of Damping Analysis of Hybrid Composite Friction Disc Clutch

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Abstract. A comparison study of traditional disc clutch and hybrid composite was made considering mechanical performance. Mechanical test were performed to evaluate the best characteristics .Hardness and damping tests (as the most affected properties on disc clutch) were calculated. The test results of hardness and damping ratio showed an increase in damping ratio when replacing the traditional disc clutch with hybrid composite. Amplitude of vibration is decreased due to the usage of reinforcing materials. Hardness of hybrid composite was increased compared with traditional disc.

Paper ID: 252

Effect of Graphene oxide and Gold Nanoparticles on Kidney Parameters of Male Mice

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Abstract. In This Study We Investigated The Toxicity Of Graphene Oxide And Gold Nanoparticles On Kidney Function Parameters Using Animals Model. The Nanoparticles Were Confirmed Using Different Parameters Like Uv Visible Spectroscopy. The Morphology Was Characterized By Sem. Moreover, Their Effectiveness In Kidney Parameters Had Been Studied. These Parameters Included Measurement Of Urea, And Creatinine Levels And Histopathology Sections For Kidney After Injection Of Nanoparticles Intraperitoneal In Male Albino Mice. The Results Of Biochemical Tests Are Showed No Significant Changes In Urea, Creatinine Concentration Compared With Control Group. Then We Confirmed Our Results Using Histology Sections Of Kidney. In Conclusion There Are No Significant Differences In Levels Of Urea, Creatinine Between When Compared With Control Group. So The Results Indicate That Graphene And Gold Nanoparticles Have No Toxic Effect On Kidney Of Male Mice.

Paper ID: 254

Properties of Concrete with Magnetic Mixing Water

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Abstract. The effects of using magnetic water as mixing water in concrete on compressive strength, workability and required cement content was investigated. Concrete mixes were prepared using magnetic field treated mixing water and compared with regular concrete mixes that were made with normal (non-magnetized) tap water. Magnetizing the mixing water was performed by allowing the tap regular water to pass through magnetic fields that ranged in magnetic strength between 0.9 and 1.3 Tesla. Water / Cementitious material ratio, curing age, intensity of the magnetic field as well as cement content were used as the main variables that were investigated as to their influences on the behavior of magnetic mixing water concrete as compared to concrete with normal non-magnetized mixing water. Results showed that the workability of concrete has increased slightly compared with tap water mixed-concrete. At different curing ages, compressive strength of concrete was found to improve considerably as a result of mixing water magnetizing. The maximum enhancement of concrete compressive strength was obtained at the maximum magnetic field intensity used, which was 1.3 Tesla. Compressive strength enhancement was found to be more significant at early ages. It was also found that almost similar levels of fresh concrete workability and 28th day compressive strength and were obtained with 7.5% reduction of cement content for concrete samples made with magnetized mixing water as compared to those made with normal non-magnetized water. This cement requirement reduction may promote the potential to use magnetic mixing water as a positive modification towards a more sustainable concrete.

Paper ID: 256

Influence of laser Energy on the Characteristics of Ag2S/ITO Thin Films Solar Cell Prepared by PLD Technique

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Abstract. Nanoparticle silver sulfide (Ag_2S) thin films have been prepared by pulse laser deposition technique (PLD) on the Indium tin oxide (ITO) substrates. Nd: AYG laser has been utilized in PLD system with wavelength of 1064 nm at different laser energies from 400 mJ to 900 mJ with increment of 100 mJ in each sample. The number of laser pulses has been set constant 200 pulses in each step. The structure properties of thin films as deposited on the ITO substrate have been characterized by X-ray diffraction (XRD) and Atomic force microscopy (AFM). Solar cell measurement has been studied by J-V characteristics for the back and front contacts.

Paper ID: 257

Effect of Particles Size of Zirconia on the Mechanical Behavior of the Polymer blend

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Abstract. In this work, emphasis was placed on the manufacture of a hybrid composite based on a polymeric blend reinforced with (macro and nano) zirconia particles, and a constant ratio of chopped kevlar fibers (0.5% wt). Polymer blend consist of (25% polyurethanes and 75% PMMA) was taken. The polymer blend was then reinforced with zirconia particles ((10, 5) um and 100 nm). The results showed that there was a clear improvement in the mechanical behavior of the polymer mix after it was reinforced by particles and fiber compared to its behavior when reinforced by particles only. The composite materials reinforced with particles only give value of tensile strength up to (77, 79, 88) Mpa, flexural strength (90, 93, 96) Mpa, impact strength (30, 35, 37) KJ/m2 and hardness shore D (81, 83, 88) at the particle sizes ((10,5) um and 100 nm) respectively. While the composite material reinforced with the (ZrO2) particles and chopped kevlar fibers (0.5% wt) gave higher mechanical properties as tensile strength (85, 87, 109) Mpa, flexural strength (97, 98, 108) Mpa, impact strength (41, 40, 45) KJ/m2 and hardness shore D (85, 89, 92) at the particle sizes ((10, 5) um and 100 nm) respectively.

Paper ID: 258

Investigate the Colloidal Nano-Zinc oxide Addition on the Strength Acceleration of G-Sand Cement Mortar

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Abstract. The fundamental purpose of this research is to affect the addition of nano-particles to both physical and mechanical characteristics of G-sand-cement mortar with and without additional mortar nano-particles. The nano-particle used by this research was nano-zinc oxide (nano-ZnO) with a graded particle size of 10 to 30 nm. This study provides the mixing technique of incorporating nano-materials and G-sand mortar activities for several specimens under varying curing period with steady water-to-cement ratio (W / C=0.45). Some mechanical variables such as (compressive strength, flexural strength and porosity tests) have been evaluated.The proportion of nano-material addition to cement mortar blend involves (0, 0.75, 1.5, 2.25 and 3 percent) nano-materials with the proportion of proper aggregate use 2.75 from cement volume.The Results data confirm that mortar strength in 1.5 percent and 2.25 percent ZnO nano-particles are desirable as conventional mortar. The experimental data that was illustrate the specified strength of the colloidal mortar consists of ultrasonic dispersion of nano ZnO will be improved most characteristics than control samples. However the nano-zinc oxide components offer excellent characteristics up to 2,25 percent.

Paper ID: 259

Dependence of *O. vulgare* extract and cold Plasma on the Formation of Silver Nanoparticles: Anticancer Activity Against L20B Cells

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Abstract. In this study, silver nanoparticles (AgNPs) were synthesized by adding Origanum Vulgar to silver nitrate ($AgNO_3$) in addition to the use of cold plasma. The OV-Ag NPs formation process can be monitored once the color turns red as a base marker; the color change of the solution represents the withdrawal of nitrate salts from the compound and the occurrence of surface plasmids. Part of the NPs of cold plasma is a second extract that can be used in treatment. Factors such as size and shape characteristics, plasmodium surface, structure and optical properties were studied by UV spectroscopy, FE-SEM, FT-IR and AFM. The average particle size distribution is found identical for both (44.2 - 88.1) nm in $(AgNPs)_1$, while the average particle size distribution was (44.2 - 86.1) nm in $(AgNPs)_2$. Then, OV-Ag NPs were added to the L20B tumor cell lines. The results showed that NPs were effective in inhibiting human pathogens in the presence of (NPs)1. The inhibition efficacy was found to be better for (NPs)1 compared to $(NPs)_2$, because of a combination in the compound after exposure to plasma energy. The results also showed that NPs response based on dose concentration used against L20B tumor cell lines. Antioxidants were also identified in all cell groups. In addition, the resulting damage rate was calculated in the DNA of L20B tumor cells. The rate of damage in the DNA of cancer cells increased after exposure. The results showed that NPs located on living cell lines gave better results than control.

Paper ID: 260

Production of Geopolymer Adhesive Paste Material for NSM Technique

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Abstract. Near-surface mounted (NSM) is one of the most promising strengthening techniques of reinforcement concrete (RC) structures that have attracted the attention of researchers. Epoxy was bond material in this technique, epoxy had good adhesive material but the rapid failure of the mechanical properties of the matrix at high temperature, and the dangerous effects of toxic gases during the application, led to reduce the use of this technique in high temperature areas; therefore now we need to replace the epoxy by new material. This study presents production of new adhesive from geopolymer paste used for the first time in NSM as alternative of epoxy. Then, to obtain best amount of adhesive material, we studied different dimensions of groove in order to reach the optimum groove dimensions. An experimental single lap shear test (pull-out test) was using to study the bond characteristics. The test results showed at the optimum dimensions of groove that geopolymer paste has good efficiency as a bond adhesive material in NSM strengthening technique.

Paper ID: 261

Performance Analysis of a Bi-Fluid Photovoltaic / Trombe wall under Iraqi climate

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Abstract. The hybrid photoelectric thermal system faces an important problem of overheating of solar cells, which leads to a decrease in the efficiency of the hybrid Trombe wall. This study examines the possibility of improving the performance of the Trombe wall by cooling solar cells using water and air simultaneously. In addition, the effect of glass cover on solar cell temperature and electrical and thermal efficiency of PV / TW system were studied.Thus, the presence of the glass cover increases the electrical and thermal efficiency by (4% -13%) respectively compared to the condition of classical solar cell. It is recommended to combine the DC fan with PV / TW system to increase the cooling of the solar cells and increase the air circulation inside the test chamber to improve the performance of the PV / TW system.

Paper ID: 262

A Comparison Study between Base and Forced Excitation at the Top Floor for Multi-story Structure

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Abstract. Multistory buildings may subjected to many types of vibration excitation which affect their structures and properties. The period of vibration or natural frequency is an important parameter in building design as it governs the effect of wind or earthquake. A four story model has been constructed which simulates a multi-story shear structure (like a building). This model is connected to a shaker and a system of accelerometers to measure the dynamic response of that model and to make a comparison for two types of vibration excitations: base excitation and forced excitation at the top floor in order to investigate the dynamic response for the two cases. The results for the base excitation showed that the fundamental natural frequency was less than that for forced excitation at the top floor, and new natural frequencies have appeared in the spectrum.The level of vibration for the natural frequencies ishigher compared to forced excitation. The overall level of vibration is higher too, and lookslike the system became a self-excitation. The mode shapes for the two cases were determined also, and compared to show that the more critical case is the base excitation.

Paper ID: 263

Effect the addition of Foam agent on some properties of cement mortar

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Abstract. Foamed concrete is a class of light-weight concrete; foam concrete does not consist of coarse gravel and can be considered as an aerated mortar. This paper presents the results obtained by using foam agent type (EABSSOC) to produce foam concrete (FC), the cement to sand ratio was 1:2, while the W/C were 50% and 45%, foam agent (FA) was added with percentages (1 and 0.8) %. The results showed that the optimum composition which contained 0.8wt. % of foam agent have higher values of the compressive strength, splitting tensile strength (T.S) and flexural strength (F.S) for the samples cured in (air and water) for different periods included (7,14,28) days with density is nearly 1600 kg/m^3 compared to the concrete samples that contained 1wt. % of foam agent. It is found that addition of foam agent to the mortar mix gives it good properties such as easier molding and better homogeneity, lightweight and cheap. These reasons make this kind of concrete more popular for many applications, for example the thermal insulation.

Paper ID: 264

Predicting the physical, microstructure, and mechanical properties Of Cement Mortars Containing waste polypropylene and nano zirconium oxide

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Abstract. This work has been explain and verify that the bond of the nano strongly affect the capacity of waste polypropylene to become stable crack in the construction materials. As the link among waste polypropylene nano zirconium oxide and base materials is mostly mechanical, it seem that incorporate ZrO_2 nano addicted to waste polypropylene with cement composites by reinforced which provides improved the bond with base materials through hole modification and improved division of products of the hydrate. This work an effort has been completed to study for the result of waste polypropylene nano zirconium oxide on the properties of the mechanical of mortar materials. The nanozirconium oxide can be used as energy enhance to raise the concrete strength and used to help waste of the plastic to enjoy with the mixture, waste polypropylene nanozirconia and WPP are additional to the materials of the mortar by percentage of adding (0 % , 0.3 %, 0.6%, 0.9%, 1.2%, 1.5%, 1.8, 2.1 and 2.4 %) and (0%, 0.5%, 1%, 1.5%, 2%, 2.5%, 3%, 3.5%,4%, and 4.5%) that can be mix with alone for every samples with the water. The dispersion of the uniform of waste polypropylene and nanozirconia in the mixture of the cement and following addition (45-60) % can be add to the mortar, the samples with nanozirconia give tensile, the high compressive, strength of the hardness when compare to usual mixture at every different fraction of waste polypropylene and nanozirconia and it increase the strong point after curing age up to 90 days..

Paper ID: 265

*M*ultilayer *C*oatings D/M/D for *S*olar Reflector Applications *P*repared by *DCM*agnetron *S*puttering

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Abstract. *M*ultilayer structures containing dielectric/ metal/ dielectric layers have been deposited on glass and coated with ITO substrates using DC magnetron sputtering technique. *T*he multilayer coating based on interference effects can be realized by stacking metal (Ag) as a sandwich between two a high index dielectric (V2O5) i.e. V_2O_5/Ag/ V_2O_5. .V_2O_5 thin layers have been deposited using reactive DC magnetron sputtering technique from the sputtering of vanadium target in Ar/O_2 mixture. X-ray diffraction (XRD) has been confirmed that the deposited thin layers are composed mainly of V_2O_5 phase. The reflectance spectra from visible to *NIR* wavelengths (300-1100) nm of multilayers were recorded. *T*hese thin layers were transparent for visible spectrum 400 - 800 nm however reflecting IR radiations beyond 800 nm. The optical measurements for all the thin layers samples that were prepared, which based on V_2O_5/Ag/V_2O_5 multilayers structure with varying thickness 20,40,60,80 nm of top layer for V_2O_5 while 10,20 nm of middle layer (Ag) and bottom layer (V_2O_5) respectively. *R*esult shows that, the *ITO* single and V_2O_5 (20nm) / Ag (10nm)/V_2O_5 (40nm) multilayer gave maximum transmittance about 92.4 % at 550 nm. Also NIR reflection of the multilayer coating is less than 10% in the VIS range and it enhanced to over 80% in the NIR range of V_2O_5 (20nm)/Ag (10nm)/V_2O_5 (20nm) multilayer. The best performance was accomplished for the heat mirror with 10 nm of Ag thickness and 20nm of outer layer of V_2O_5**.**

Paper ID: 266

Nanosilicon powder Extraction as a sustainable source (From Iraqi Rice husks) by hydrothermal Process

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Abstract. The High-purity silicon nanoparticles (SiNPs) were successfully produced by hydrothermal process (low temperature molten salt process) from nanosilica. The used nanosilica was extracted from Iraq agriculture sources by precipitation process. (SiNPs) was prepared via the reduction of nanosilica by metallic Al in molten $AlCl_3$ inside steal autoclave at temperatures 200 and 250 ^{o}C. The obtained powder was leaching with 1MHCl for several hours then leaching with 10% HF for 10 min. The structural properties of the obtained (SiNPs) were analyzed and measured by X-ray fluorescence (XRF) and X-ray diffraction (XRD). The size of the obtained particles were measured by using Atomic force microscopy (AFM). The results indicated that, the combination between hydrothermal Process and specific chemical leaching process is considered as an efficient method for obtaining (SiNPs) at both 200 °C and 250 ◦C. also the results show the high purity nanosilicon (99.94 %) was obtained at 250 ^{o}C. at 200 °C, The particle size of (SiNPs) were 46 nm . The particle size was increasing to 59 nm with rising the temperature to 250 ◦C.

Paper ID: 267

Removal of Ciprofloxacin from Aqueous Solution Using Pistachio Shell Coated with ZnO Nanoparticles:(Equilibrium, Kinetic and Isotherm Studies).

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Abstract. In this study, adsorbents were synthesized from pistachio shell and zinc oxide nanoparticles (CPS)for elimination of ciprofloxacin (CIP) from simulated wastewater, surface morphology, functional groups and surface area of CPS were observed by SEM, FTIR and surface area analysis, respectively. Effects of significant parameters such as solution pH, CPS dosage, particle size, shaking speed and initial CIP concentration on CIP adsorption capacity were studied. The results were revealed using adsorption isotherms, and kinetic models. The maximum adsorption capacity obtained was 123.76 mg g-1 at the pH 4, 0.1g CPS /100 ml CIP solution, 87 µm,150 rpm at a temperature of 25 °C. An isotherm model study showed that the results of the experimental work were a good fit with the Freundlich model. Pseudo second order model best fit the kinetics of CIP adsorption onto CPS with high coefficient of determination and more closely experimental uptake and the intraparticle diffusion is not the dominant mechanism. Thermodynamic parameters (ΔG° and ΔH°) showed that CIP adsorption onto CPS was a spontaneous and exothermic in nature. The results proved that CPS exhibits an excellent adsorbent for CIP removal from aqueous solution.

Paper ID: 268

Investigation Hydraulic Performance of Splash Fills Packing in Cooling Tower

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Abstract. Heat is one of the most energy forms emitted to atmosphere by industrial processes. Water is considered to be the best material to reduce heat energy since its available in nature in abundanceand has the ability to absorb heat efficiently. Cooling towers are ideal alternatives to re-cool hot water instead of throwing it especially in places that lack natural water resources or when there are environmental precautions because water with high temperature would be harmful to the ecosystem when it recycled to natural resources such as rivers and lakes. Also, cooling towers considered economically feasible when using west water. This paper interests with hydraulic characteristics of a counter flow wet cooling tower which was investigated experimentally. The tower filled with splash packing with Zig-Zag pattern. Current study used treated waste water and focused fundamentally on the influence of air and water flow rates on hydraulic features of cooling tower for different access water temperatures. The dependency between pressure drop and the air and water flux was spotted. In this study, it found that within a certain ranges the pressure drop increases by 75% due to liquid flux and 70% due to air flux while pressure drop is not affected by changing temperature at all. Two empirical correlation had been founded for dry pressure drop (with R^2=99.5%), and for wet pressure drop (with R^2=98.13%).

Paper ID: 270

The Synthesis and Biological Evaluation of Prodrug Amide Derivatives Based on Phenylene Dioxy Di Acetic Acid

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Abstract. Seven new amides compounds (1a-7a) prodrug derivatives based on phenylene di oxy di acetic acid as well as study their antibacterial and DPPH radicals scavenging activities. The structure of synthesized compounds were elucidated *via* modern spectroscopic techniques including NMR, IR and UV. (4a-7a) The antibacterial effect of compounds 1a-7a were estimated on *Escherichia coli* (-) and *Staphylococcus aureus* (+), compound 6 display the generality powerful, inhibitory efficacy with inhibition values of 28 and 20 µg/ml for *Escherichia coli* (-) and *Staphylococcus aureus* (+), respectively. Compounds displayed DPPH radicals scavenging activity compare to the ascorbic acid. As a conclusion, seven compounds have been synthesized and the compounds showed potential against two bacteria species and DPPH radicals. The findings of this study can enhance the understanding of biological activities of the amide compounds.

Paper ID: 271

Preparation of CuO NPs by laser ablation in liquid for Photodiodes

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Abstract. CuONPs/Si heterojunction photodetector made via dropped CuONPs on Si wafer using drop casting method. The nanoparticles were accomplished by applying laser ablation of copper pellet immersed in water. The morphological and optical properties were measured using AFM and UV spectroscopy. The NPs has high absorbance in the visible region with 2.7eV an average particles size about 77nm. The heterojunction of CuONPs/Si has good linearity with 21.67 on/off ratio and peak response about 0.33A/W at 650nm.

Paper ID: 272

Mechanical Performance Study of Asphalt by Waste Plastics and Waste Engine Oil

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Abstract. This study attempts to develop innovative modified asphalt with waste materials to improve asphalt's performance. Different amounts of waste polymer (poly ethylene terephthalate -PET) and waste oil (waste engine oil- WEO) were added to a virgin asphalt to produce new modified asphalts. The binder modified with PET/WEO ratio of 2% and 3 % exhibited promising characteristics (high softening point temperatures and penetration slightly higher than the conventional asphalt). Furthermore, this paper discussed the effects of additives on the properties of asphalt binder. Beyond that, this modified asphalt obviously enhanced some mechanical characteristics of the asphalt where it was used, in comparison to conventional**.**

Paper ID: 274

The Hardened Characteristicsof Self-Compacting Mortar Including carbon fibers and Estimation Results by Artificial Neural Networks

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Abstract. The purpose of the research was to investigate the effect of adding carbon fiber on the self-compacting mortar (SCM) and its effect on the hardened properties of the SCM. The carbon fiber was added to the mortar with a length of 6 mm was ratios 0.05%, 0.1%, 0.2%, and 0.4% of the cement content and five ratios of water to cement ratio (W/C) (0.55, 0.57, 0.6, 0.62 and 0.65)to improve its properties in the hardened state. The method of artificial neural networks (ANN) are used to analyze the results. Multilayered networks by reactionary error distribution technology were used in modeling to analysis of results, that obtained by giving weights for each element affecting on the self-compacting mortar, which is improved by carbon fiber. The add fiber was an effect on the fresh properties of the SCM, the results show that fibers reduced the time of flow (ToF) and diameter of flow (DoF), improved the hardened properties mortar by increasing flexural (Fle.) by (67%), the addition had little effect on density (Den.). Also the ANN model show that network has the ability to predict the results of the tests of self-compacting mortar with a good accuracy reached (97.58%), also the model showed that the ratio of the effect of each input, where the (w/c) have the greatest effect in fresh properties of the self-compacting mortar with percent 73.4%, and in hardened properties of the self-compacting mortar with percent 39.3%.

Paper ID: 275

Friction stir welding of Aluminum Alloy 6063 pipe with Aluminum alloy 7022 pipe

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Abstract. There are a little studies are made in friction stir welding of similar pipes and very little in friction stir welding of dissimilar pipes, for this reason this study done on joint of friction stir welding for aluminum alloy 6063 pipe with aluminum alloy 7022 pipe to calculates the mechanical properties with tensile test, microstructure test, hydrostatic test, and Microhardness test. In addition to analysis this joint by finite elements analysis with Ansys 18 software. Moreover, the parameters used in this welding were; welding speed, speed of rotation, tilting angle, tool geometry and load force. All the results were indicated that the good weld was case 1 where the rotation speed was 775 rpm.

Paper ID: 276

Extraction of some compounds from the wormwood (Artemisia Absinthium) plant in Iraq by organic methods

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Abstract. The objective of this study was to analysis of the Iraq Artemisia absinthium and the main component was and identified by NMR experiments is Anthocyanin. The increasing interests in carrot anthocyanin are encouraged by the mounting evidence proposing health-promoting and high antioxidant power. The Artemisia absinthium L. is a medicinal and aromatic bitter herb commonly utilized in traditional medicine like an antimicrobial agent since ancient times.

Paper ID: 277

Teleoperating and Monitoring of CNC Turning Machine Under Web Framework

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Abstract. CNC machines have become an important component in the development of the manufacturing process. Wireless technologies can support all industrial needs as well as provide cost-effective solutions by connecting CNC machines to a wireless controller that allows the user to sit on a computer to send data to various locations without using any wire to control and teleoperate the CNC machines and monitor them remotely. This research focuses on the operation and remote control of CNC machines for machining of mechanical parts through the design and implementation of a wireless system through which a computer equipped with appropriate design and simulation software transmits the required data to the router, which in turn transmits the operating data to the control unit of the CNC machines. While a digital camera monitors the operation and broadcasts the real-time virtual scenes of the implementation to monitor the operation. In practical application, we used the UGNX program to implement the initial design of the parts to be machined, as well as to generate the required tool path and the simulation. While we used a CNC lathe type LabVolt to receive the data and machining the parts while a digital camera was connected to monitor the machining process.

Paper ID: 278

Synthesis of Carbon Nanotubes by theCatalytic FlameDeposition of Coal

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Abstract. Carbon nanotubes with multi-walled were synthesized by flame deposition method from coal which catalysis by using two metals Fe and Mo at 413 K. the process of flame deposition was done with homemade reactors manufactures for this aims. The synthesized products were characterized by X-ray diffraction XRD, Raman spectroscopy, and scanning electron microscopy SEM. The results shows that Mo more active then Fe to growth tubular structure in the condition of precipitation. The MWCNTs which prepared with Fe shows few filament of carbon with average diameter 15-51 nm and length more than 0.8 μm. The MWCNTs which prepared by deposited onto Mo surface showed many filaments of carbon at diameter 36-67 nm with length more than 1.8 μm.

Paper ID: 279

The influence of Aggregate Gradation Designed by Bailey Method on the Volumetric Properties of Asphalt Mixture Prepared by Superpave Design Method

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Abstract. Asphalt mixture contains approximately 90–95% of mineral aggregates by weight and aggregate gradation considers one of the key properties in the aggregate blend. Therefore, the effect of aggregate gradation on the performance of asphalt mixtures has been a considerable issue. Mid-limit gradation curve is recognized as the most proper gradation, but don't always produce desirable results .The Bailey method provides a means for designing of aggregate gradation in asphalt mixtures, taking into consideration the volumetric properties of aggregate blend, so that asphalt mixtures exhibited a strong skeleton for high stability and appropriate VMA for good durability. Bailey method calculations are time consuming. Therefore, Excel spreadsheet is developed in order to save time and decrease the calculation errors. Eight aggregate blends, which include fine and coarse graded mixtures with four blends for each of the two types of mixtures, are designed for the evaluation of Bailey method and the optimum asphalt content is determined for each gradation. The tests for determining volumetric properties of asphalt mixture are conducted to find the effect Bailey parameter on the volumetric properties of the asphalt mixture.

Paper ID: 280

Compare Studies for the Photocatalytic Degradation of Thymol Blue with Synthesized and Commercial MWCNTs

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Abstract. Multi-walled carbon nanotubes were prepared by chemical flame deposition at 413 K by using coal as a source of carbon. The product was characterized by XRD, Raman spectroscopy and SEM. The synthesized MWCNTs were tested in photocatalytic degradation of thymol blue by impregnated TiO_2 with synthesized and commercial MWCNTs. The work includes compare for the activity with and without H_2O_2, which showed increased the activity of TiO_2/MWCNTsyn more than TiO_2/MWCNTcht with H_2O_2. The mechanism was supposed to explain the activities TiO_2 after modifying with two types of MWCNTs and find that H_2O_2 enhance the activity due to create new sources for the active sites with probabilities for accruing Fenton reaction by H_2O_2/Fe for synthesized MWCNTs.

Paper ID: 281

Solar Photo Catalytic Degradation of Reactive Yellow Dye by Suspended Titanium Dioxide and Hydrogen Peroxide

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Abstract. This paper estimates the decolourisation of an azo dye Reactive Yellow (RY) by advanced oxidation processes viz., solar/TiO2 /H2O2. The results showed that the process could be effectively used for the decolourisation using sunlight which is more economic and cost-effective. The study on the effects of various experimental parameters such as pH, dye concentration, light intensity, TiO2 catalyst loading, H2O2 the solar decolourisation revealed that these parameters influenced the removal rate. As a result 94% of reactive dye can be removed at a TiO2 loading of 25 mg/l, H2O2 concentration of 400 mg/l and of pH: 7.It can be concluded from these results that the pH values of the treated dyes were changed to reach a pH value of water (around pH 7.8). However, it considered an important point, that treated water has a pH values in the range of neutral water. These results may be seen to agree with the principles of Green Chemistry as they provide products that are Eco- friendly to the surrounding..

Paper ID: 282

The Virtual Surgery to Reconstruct the Mandible Using Digital Images

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Abstract. In this paper, the restoration of the Mandible after trauma or eradicated as a result of cancer tumors is a difficult challenge faced by Oral and maxillofacial surgery. The mandible is an essential element in the appearance of the human face. It gives the distinctive shape of the face, carries the lower teeth, and also supports the processes of expression, breathing and chewing. The purpose of this paper is to propose a new methodology and strategy that provides an integrated environment of techniques and software used to simulate implantation based on patient medical imaging data and the creation of an STL model. The implantation included a case study of a 35-year-old man with a traffic accident in the Mandible. Obtained patient data obtained from CBCT to design a medical model for the required area. Modeling done using threshold technology and computer-aided design. A suitable environment for a comprehensive medical simulation was developed to construct the final medical model and integrate implantation and mandible using the Meshmixer platform. The proposed processes and methodology illustrate the possibility of more specialized implantation where rapid prototyping and reverse engineering techniques can be applied in the medical field to improve surgery, diagnosis, and treatment.

Paper ID: 283

Evaluation of Material Hardness Based Image Processing Tool

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[1, 2, 3]*(Dept. of Laser & Optoelectronics Engineering, University of Technology, Iraq)*

Abstract. In this paper, we present a new evaluation tool for materials hardness measuring by using Digital Image Analysis (DIA) instead of the classical approach. In this method Hardness mechanism achieved by processing materials image using certain image processing steps. The processing steps are: capturing material image using a specialized microscope, reading the captured image, pre-processing, image enhancement, Region of Interest capturing (ROI) and, finally hardness computing by calculated the number of burned pixels in ROI with averaging to total size of that region. The results showed that the proposed method gives good results in a comparison with classical hardness evaluation. As well as it considers a new user-friendly computerized hardness evaluation program for experimental materials evaluation.

Paper ID:284

Preparation and Characterization of Biodegradable Crosslinked Starch Ester as Adsorbent

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Abstract. Crosslinked starch ester is one of the important biomaterials, biodegradable, low cost and effective adsorbents for removing various types of organic contaminants. Crosslinked starch represents an important class of starch derivatives. The native starch has been modified to functionalize the structural properties of starch and make it able to act as a sorbent for organic pollutants using chemical modification. The cross-linked starch ester for four starch types, which are corn, rice, potato, and tapioca has been prepared with epichlorohydrin (EPI) as a crosslinker and trisulfonated sodium amine ($N(SO_3Na)_3$ as a sulfating agent. Fourier transform spectroscopy (FT-IR), zeta potential (ZP), scanning electron microscopy (SEM), atomic force microscopy (AFM) and Brunauer–Emmett–Teller (BET) were used to characterize the morphology of native and modified starch. Crosslinked potato starch ester (CLPSE) evidently is the more preferable modified starch type that has the greatest potential for adsorption removal for aniline, phenol, and antibiotic in 100 ppm initial concentration with 75.6%, 82.3%, and 90.7% respectively when compared to the other modified starch.

Paper ID: 285

Simulation Study of Two Units of Pressure Swing Adsorption for Producing Oxygen and Nitrogen Simultaneously

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Abstract. An investigation on two processes of pressure swing adsorption (PSA) to produce oxygen and nitrogen simultaneously was conducted numerically through exploiting depressurizing and purging gas of each process by each other. Each unit included two bed six step PSA process. The first unit packed with zeolite 13X for oxygen generation, and the second unit packed with carbon molecular sieve (CMS) for nitrogen generation. Three configurations were studied, two process were operated individually, depressurizing and purging gas of each process used by other unit (no gas vented to atmosphere), and the third configuration was similar to the second configuration except purging gas of the second unit was vented to atmosphere. Configuration three produced oxygen with purity 98% and nitrogen with purity 95% together in comparing with configuration 1, and 2. Configuration 2 produced oxygen with purity over 99% while nitrogen purity dropped dramatically to be lower than its atmospheric purity (78%). Oxygen and nitrogen purity in all configuration improved with increasing the adsorption pressure.

Paper ID: 286

Preparation and Modification of 13x Zeolite as a Heterogeneous Catalyst for Esterification of Oleic Acid

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Abstract. In this study, the synthesis of 13X zeolite as a byproduct from Iraqi insoluble potash ores accompanied by potassium carbonate preparation was investigated. The efficiency of citric acid as dealumination agent was evaluated for the prepared 13X zeolite by varying the experimental conditions, namely concentration (0.1 and 1 N), treatment temperature (25 and 75 °C), and reaction time (1 and 3 h). The effect of the citric acid treatment on structural and textural of the obtained products was monitored using X-ray diffraction (XRD), X-ray Fluorescence (XRF), N_2 adsorption-desorption Brunauer Emmett–Teller (BET) analysis, scanning electron microscope (SEM), and energy dispersive X-ray spectroscopy (EDX). XRD results showed that dealumination with 1 N citric acid causes structural damages for the zeolite and transforms it into alpha quartz, while the XRD pattern was similar to that of prepared 13X zeolite when treated with 0.1 N citric acid. XRF shows that the Si/Al ratio was much improved than the prepared zeolite. Prepared and selected dealuminated catalysts were tested as a heterogeneous catalyst for the esterification reaction of oleic acid with 6:1 ethanol to oleic acid molar ratio and 5% wt. catalyst relative to oleic acid at 70 °C for 1h. A higher conversion of oleic acid was obtained using the modified 13X zeolite, as opposed to the direct use of the non-improved prepared catalyst.

Paper ID: 287

Effect of Wire Diameter on the Flow Structure in Oscillatory Helical Baffled Reactors

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Abstract. Oscillatory baffled reactors (OBRs) are a novel process support the transformation of significantly long residence time from batch to continuous processing. Yet, oscillatory helical baffled reactors OHBRs have only been developed at intermediate scale, however, they showed significant features over the conventional plug flow such as wider range of operating conditions. Thus, further intensive studies are needed to evaluate the performance at larger scales.To achieve this goal, computational fluid dynamics (CFD) study was conducted in the present research.The flow pattern in an oscillatory helical baffled reactor (OHBR) was modelled and investigated over a range of the wire (helical) diameter, e, and oscillation conditions, Re_o. At high oscillation condition, Re_o =126, significant effect of the wire diameter on the vortex size was observed. Also, the smallest wire diameter, e=0.8 mm, showed higher radial velocities. However, the effect of e was negligible at Re_o=377, and the largest wire diameter displayed higher radial velocity. In addition, it can be study confirmed that OHBR can be applied in various applications regardless of the coil diameter if the oscillation was high enough.

Paper ID: 289

Synthesis and Characterization of High Silica HY Zeolite by Basicity Reduction

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Abstract. A High silica NaY zeolite was prepared by sol-gel method using sulfuric acid to adjust the alkalinity of solution for leaching the framework aluminum and increase extraframework aluminum species inside the zeolite structure, in order to enhance acidity, thermal and hydrothermal stability, and catalytic activity. The prepared zeolite was transformed into H-form by the ion exchange process. The Y zeolites characterized by using X-ray diffraction (XRD), Fourier transform infrared spectroscopy (FTIR) X-ray fluorescence (XRF), Atomic force microscopy (AFM), Brunauer –Emmet- Teller (BET) nitrogen adsorption method, and thermogravimetric analysis (TGA). The X-ray pattern of dealuminated zeolite was NaY type. In general peaks intensities decreased and the crystallinity increased at pH=12.8. The FTIR of dealuminated zeolite were matched the standard FTIR peaks of nanocrystalline zeolite Y, except it has high intensity in the band of hydroxyl groups (3400-3600) cm^{-1} which indicates to stronger Bronsted acid sites. The Si content of Y zeolites was sharply increased after dealumination, Si/Al ratio increased to 5.6 for dealuminated HY zeolite. The AFM of dealuminated HY indicates small nano particles with an average size of 64 nm, compared with HY before dealumination of 77.5 nm. The surface area and pore size decreased with alkalinity decrease to 101.988 m^2/g and 2.73 nm respectively. The TGA shows low hydration in HY after dealumination which lost in two steps and mainly at 248.5^oC, while four steps were required for dehydration for zeolite before dealumination. This result gives a confirmed for the change the morphology of the dealuminated HY zeolite resulted from alkalinity change, which reduced the hydrophilicity and increased hydrophobicity

Paper ID: 290

Corrosion Resistance Enhancement by Laser and Reduced Graphene Oxide-Based Nano-silver for Aluminum 1050 Alloy

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Abstract. This paper describes a new approach to enhance pitting corrosion resistance of Aluminum 1050 alloy. The Aluminum surface was treated by pulsed laser (847 mJ) pre to the anodizing process. Anodizing process was processed at 15 V in hybrid electrolyte saturated with reduced graphene nanocomposite (rGO-Ag). The oxide layer was analyzed using polarization test and cyclic test. The microstructure and metal composition of the modified surface structure were investigated using a scanning electron microscope and an energy-dispersive detector. Adding graphene nanocomposite to electrolyte can enhance the current density (I_{corr}) 96.60 $\mu A/cm^2$ and corrosion potential (E_{corr}) -395.4 mV. Q-Switched Nd: YAG pulsed laser surface treatment offers a significant increase in corrosion resistance. Laser performance result creates a big difference in the protection of Aluminum surface compared to the untreated sample. The process that was carried out in this research is used to improve pitting corrosion resistance

Paper ID: 291

The Study of the Magnetic Field Effect on the Properties of Calcination on Hot Surfaces Submerged with Water.

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Abstract. The study of possibility of using the electrical magnetic field (EMF) technique in formation of calcinations (scales formation) on the hot surfaces submerged using hard water (in heat exchangers pipes or boilers), also the studying the effective and controllable parameters on the mechanism of scale formation and properties of the formation of calcinations. Photomicrograph and XRD of scales are used for the characterization of scales formation. The new process design of water heating (boilers) experimental system was used after carrying out the basic process designs of the system. This system was used to study the effect of the temperature of hard water (40-90 °C) and hard water flow rate (0.6-1.2 L/min) on the total hardness (TH) with time as a function parameters of precipitation of hardness salts from hard water and scale formation properties. Different (EMF) designs in the heating experimental system were used to study the effect of (EMF) strength (200-500 Gauss) on the (TH) and properties of calcinations formation with time as a function of precipitation of hardness salts from water as scales and the formation of calcinations type and found the aragonite scales type formation because of (EMF) .

Paper ID: 292

Properties of Swelling Soil Improved using Mixture of Polyethylene with Silica Fume and Cement Kiln Dust

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Abstract. Expansive soils (also known as shrink/swell soils) are encountered in various regions of the world. The behavior of this type of soils is quiet complex. As they fall in the category of 'problematic soils'. Swelling and shrinkage in soils occur as a result of the seasonal variations in climatic conditions which affect the water retention in soils. Climate change prediction shows that these problems may get worse in the future. This leads to more interest in this subject during the last few years, with an increasing attention, in experimental investigations, modeling, and field investigations. In order to reduce the pollution and to keep the environment clean and sustainable, waste and recycled materials are used in the current study to improve the undesirable characteristics of expansive soil samples in the lab. Therefore, several laboratory tests have been carried out to proof that using of a significant by-product material of the cement manufacturing process the cement kiln dust (CKD) is contributed in improving the properties of an expansive soils, silica fume material (a waste industrial material) is also be useful in reducing the effect of the shrink- swell in soils, and finally using a high density polyethylene polymer (PEHD) is showed a significant decreasing in swelling deformation and increasing in the unconfined compressive strength with some other considerable changes in the previous soil properties. The Polyethylene polymer may used to enhance the behavior of expansive soil and reduced the most common problem related to this soil (swelling potential). As well as, silica fume could be effectively used to improve the properties of expansive soil with specific limits. Therefore, the main aim of this study is to observe the ability of CKD with silica fume and polyethylene polymer in improving the characteristics of expansive soil. The results shows that using additives 10% of CKD, 5, 10, 15% of silica fume , and 5, 8, 10% of PEHD decreased liquid limit and plasticity index of an expansive soil, increased its plastic limit values, and also contributed in stabilizing the expansive soil by significantly reducing it swelling ability. The liquid limit and plasticity index are reduced from 88% to 53.2% and from 67.8% to 29.6% respectively by adding 10%CKD, 10%Silika fume and 10% of PEHD. And the swelling potential is decreased from 21.23% to 2.1% by adding these additives.

Paper ID: 293

Zinc Oxide Nanoparticles Formation Utilizing one step Laser Ablation in DIW

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Abstract. Nanoparticles production via pulsed laser ablation in water has essential advantage benefit compared to normal approaches, such as the purity and stability of the assembled nanoparticles vaporizers and colloids. Here, in this study zinc oxide (ZnO) nanoparticles have produced in deionized water using laser ablation, and the effect of different laser pulses (25–125pulse) on characterization was investigated. The XRD result found that ZnO with hexagonal structure. The absorption spectra have most absorbance at UV region with intensity increased as a number of pulses increases. FTIR prove the chemical bonding between molecules in ZnO colloidal. SEM image viewed that shape of ZnO NPs varied from irregular spherical shape to nanorod then finally cracking, as a result to increase the number of pulses to become in nanosize scale

Paper ID: 294

Investigation the Physical, Morphological and Mechanical Properties of Epoxy DGEBA By using Different Nano Materials

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Abstract. The study of this paper illustrate the enhancement of the properties of epoxy by addition of zinc oxide, zirconium oxide and (ZrO_2 and ZnO) nanostructures and examines the performance of polymer nanocomposites fabricated, which dispersed in polymer host matrices. The percentage of the additive was (0,0.25,0.5,75,1,1.25 and 1.5) wt. % for nano ZrO_2 ,(0,0.25,0.5,.75,1,1.25 and 1.5) % for nano ZnO and(0,0.5,1,1.5,2 and 2.5)wt. % (ZrO_2 + ZnO). The highest of the compressive strength at 2.5% wt. from (ZrO_2 + ZnO) and the compressive strength increased with increasing the percentage up to 1.25, 1.25, 2.5% for ZrO_2 , ZnO, and (ZrO_2 + ZnO) , respectively. As the compressive strength , the compressive modulus , ultimate tensile strength, impact strength, flexural strength, increase with increasing the additive and have the highest value for all the mechanical properties at 2.5% wt. from nano(ZrO_2 + ZnO) .The percentage of the water absorption deacreases with increasing the percentag of the additive for all samples up to 2.5% wt nano(ZrO_2 + ZnO). There was observed clearly from SEM images that the small particles uniformly dispersed in the epoxy matrix and were well connected with other. As can be seen nanoparticles aggregates are observed as white spots with a wide particle size distribution.

Paper ID: 295

Treatment of Murine Mammary Adenocarcinoma Cell Line (AMN3) With Polyvinylpyrrolidone Coated Silver Nanoparticles

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Abstract. In this project, silver nanoparticles (AgNPs) were made by pulsed laser ablation method using a metallic silver (purity; 99.99%), the targeted metallic silver piece was submerged in a liquid containing Polyvinylpyrrolidone (PVP). Synthesized nanoparticles were observed with different methods such as UV-Vis Spectrometer, Atomic Absorption Spectroscopy (AAS) and Transmission Electron Microscopy (TEM). The peak absorption spectra for the synthesized AgNPs of all types were ranged between 401 and 411 nm. The nanoparticles size were in the range between 1and 70 nm. The anticancer activity of the synthesized silver nanoparticles was tested against murine mammary adenocarcinoma cell line (AMN3). This activity was with potent inhibitory effect on the cellular proliferation rate of the cell line under investigation. The inhibitory action was elevated when both the concentration of AgNPs and time of exposure was increased in comparison with the control untreated cells. Staining the cells with crystal violet stain revealed an increase in the level of cellular destruction. The results demonstrated that the exposure of the cells to the nanomaterial increases the proportion of the cells that undergo mitochondrial membrane disruption and DNA fragmentation and thus leading to the induction of apoptosis. These results confirm that PVP-coated AgNPs induces apoptosis and cancer cell death.

Paper ID: 296

Removing the Interference of Sulphite in the Spectrophotometric Assay of Thiosulphate via Charge Transfer Reaction

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Abstract. Sulphite ions were interfered in the spectrophotometric determination method of thiosulphate using charge transfer reaction, the proposed method has been described as an accurate, simple and rapid, which was based on charge transfer complex reaction between thiosulphate and xylenol-orange as a reagent using imidazole buffer at pH 7.6. The resulted red color complex which exhibited the highest absorption value which was measured at the selected wavelength 580 nm. The linearity of the proposed method was obeyed Beer's law in the concentration range 10-700 µg/25ml of thiosulphate at 580 nm, the molar absorptivity 1.15×10^4 l/mol.cm, and Sandell index for sensitivity 0.00975 µg/cm^2, the method exhibited a good recoveries of thiosulphate from various water samples successfully.

Paper ID: 298

Synthesis and Characterization of Coated Magnetic Nanoparticles and its Application as Coagulant for Removal of Oil Droplets from Oilfield Produced Water

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Abstract: Produced water always includes stable emulsions of crude oil in water that are typically hard to treat with standard techniques of separation, caused in several environmental and ecological problems. In this study, iron oxide Fe_3O_4 magnetic nanoparticles (MNPs) were synthesized and characterized via co-precipitation method of iron salts (Fe^{+2} and Fe^{+3} ions) at 80°C, pH=14 and 0.5 molar ratio of Fe^{+2}/Fe^{+3}. MNPs were coated with different materials (PVP and chitosan) to enhance the effectiveness and stability of them. MNPs and coated-MNPs were characterized by X-Ray Diffraction (XRD), Atomic Force Microscope (AFM), Fourier-Transform Infrared Spectroscopy (FTIR) and Zeta potential analysis. Coated-MNPs were applied as coagulant in coagulation and flocculation process for removing oil droplets from oilfield produced water, the experiments occurred at 25°C and mixing rate of 240 rpm for 3 min and 40 rpm for 20 min with concentration range of coagulant (20-120) ppm, pH value (5-8) and reaction time (0.5 h to 3h). Removal percent was developed with increased in pH value to 6, while it was decreased when pH was more than 6. Increasing in concentration of coagulant give rise to increase the removal efficiency till 80 ppm, then the removal percent decreased at dosage greater than 80 ppm. Removal efficiency enhanced with increment in reaction time from 0.5 h to 3 h and decreased when reaction time reach to 5 h. The best oil removal efficiency was 90% that obtained when PVP-MNPs were used as coagulant with 80 ppm concentration and pH=6 after 3 h of reaction time. The MNPs can recovered using magnetic field.

Paper ID: 299

Study the Histological and Biochemical Profile Effect on the Extract Curubita Maschara on the Sugar Induced Rate

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Abstract. The aim of this study is to find the positive role of the extract of the Cucurbita maschara in the improvement some of the physiological parameters and Christian male white mice infected with diabetes, which was developed by aloxane, and thus the possibility of using it and supporting drugs in the treatment of diabetes. A total of 15 mice were divided into 5 groups: the first control group, the second group was treated with aloxane and left without treatment. The third group was treated with aloxne, treated for one week, the fourth group treated for two weeks, and the fifth group treated for three weeks. The dose was 3 ml daily. Blood glucose, cholesterol concentration and blood protein concentration. The results of the histological study also showed satisfactory changes and degeneration in the liver tissue in the second group compared with the first group (control group). The other three fourth and fifth, there was a marked improvement in liver tissue and correction of the damage caused by the introduction of diabetes by aloxane. We conclude from this that the extract of the Cucurbita mountain has a positive role in improving the parameters of sensory and chemical in the males of white mice with diabetes

Paper ID: 300

Low Critical Solution Temperatures and Water Swelling Ratios of Some New PNIPAAm Copolymers Synthesized by Free Radical Polymerization

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Abstract. Thephysical and thermal properties and free radical co-polymerization of new poly (N-isopropylacrylamide) (PNIPAAm) derivatives: ethylene diamine (EDA), 1,3-diaminopropane (DAP), Urea (Ur) and thiourea (TUr) were studied. In each copolymer the low critical solution temperature (LCST) which was observed at (32°C $\pm$ 1).The thermal gravimetric analysis (TGA) and differential scanning calorimetry (DSC) investigations of hydrogels shows that the loss of swelled water starts from (20°C). The swelling behaviors of all copolymers was studied into two ways and at different temperatures, were the best swelled hydrogels are PNIPAAm-co-TUr at (25°C), PNIPAAm at (35°C), and PNIPAAm-co-EDA at (45°C) based on medical cotton as a surface. The ability of water swelling has been varied according to the functions group of the co-monomer and the way of it connection in polymer chain that's due to hydrogen bonding with water. The medical cotton shows a good water swelling surface more than Iraqi fluff and tail cottons. The surface area of these polymers has been determined by Brunauer–Emmett–Teller (BET) were PNIPAAm-co-EDA have the highest surface area (9.357 m^2/g), and the PNIPAAm-co-Ur have the lowest one (0.055 m^2/g). It revealed different values according to linking terminal of these monomers in PNIPAAm backbone.

Paper ID: 301

Impact of Blowing Agent-Blends on Polyurethane Foams Thermal and Mechanical Properties

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Abstract. The thermal properties of polyurethane foams are important to meet the government mandated energy efficiency goals. Polyurethane foams blown by traditional blowing agents such as water, n-Pentane, and Methyl formate may not have the thermal and mechanical properties to meet the target of the manufacturer. Over the last few years, Forane (FBA) was introduced as the fourth-generation of blowing agents that provide excellent insulation properties for the rigid polyurethane foams. One of the obstacles of using HFCF blowing agents was the high values of global warming and ozone depletion potentials. The current research provides a study of the effect of various blends of FBA 1233zd and traditional blowing agents on the mechanical and thermal properties of rigid polyurethane foam insulation. Foam samples were blown by 0, 25, 50, and 100% blowing agent blends were studied and the results show that for which extent foam properties were changed.

Paper ID: 302

Corrosion Behavior of Mild-Steel in Cooling Towers Using High Salinity Solution

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Abstract. Cooling towers is one of the most important unit in industry, they are used to dispose heat from cooling media used in the integrated units. The choice of the cooling media plays recently an important rule due to fresh-water scarcity. The use of saline as a cooling media become of growing interest, but the corrosion problem has to be taken in consideration. In this study the simultaneous effect of cooling tower operation parameters on the corrosion rate of mild-steel is considered. The role of NaCl content is found to be pronounced more than the working solution temperature and flowrate. The corrosion of mild-steel in these studied factors had shown an interesting result especially with the NaCl% content. Firstly, there was an increase in the corrosion rate with increasing the salt content to 3.5% four times compared to that of 0%, but after a critical point (3.5%) the corrosion rate had been decreased to reach a level lower than that of pure water. While increasing the solution flowrate to 2.5 l/min and the temperature to 50^{O}C will increase the corrosion rate by 25 and 20% respectively. From the results, it is obvious that the high concentration (>10%) of NaCl will inhibit the corrosion rate of mild-steel significantly and this prologue the gate to the use of saline instead of fresh water without hesitation.

Paper ID: 303

Reinforcement Bars Development Length Determination for Ultra High Performance Concrete

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Abstract. Accelerated construction methods (ACM) have grasped researchers attention in the last decade due its influence on public convenience and projects cost and time. One of most important (ACM) application is the ultra-high performance concrete. The UHPC materials ensure super high quality, provides safer construction environment, reducing construction cost and project delivery time. However, the reinforcement bars development length in the UHPC has not been identified clearly. Therefore, in this study, a number of variables were studied to determine the length required to reach effective bond strength between concrete and reinforcing steel. Forty eight concrete models were divided into four group base on the compressive concrete strength (80, 100, 120 and 140 MPa). Each group consist of four different lengths of steel bar (2, 3, 4 and 5) and three different steel bars diameters (10, 12, 16 mm). These variables were applied into (150×150×150 mm) dimensions concrete model then tested in a push-off test. A push-off test was used to study the effects if these parameter on steel and concrete bonding behavior. Four different lengths of steel bar (2, 3, 4 and 5) times as much as the diameter of reinforcing steel were used. Form observing and analyzing the results it can be concluded that, as the development length increased from (2d to 3d, 4d and 5d), the bond stresses decreased however, in spite of the lowest bond stresses can be found in development length equal to 5d, the most influence increasing can be found as the development length increased from 2d to 3d. and as the compressive strength increased from (80 to 100, 120 and 140 MPa), the bond stresses decreased accordingly, the lowest bond stresses can be found at compressive strength equal to 5d and the most influence increasing can be found as the compressive strength increased from (80 to 140 MPa). As the bar diameter increased from (10 to 12 and 16 mm), the bond stresses increases however, the lowest bond stresses can be found at bar diameter equal to 10mm and the highest percentage in bond stress increasing can be found as the bar diameter increased from (10 to 16mm).

Paper ID: 304

Welding procedures of Steam Turbine Blades by Using ER 310L Austenitic Filler Wire

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Abstract-In the present work it has been investigated the repair of LP-blades steam turbine made of AISI 410 martensitic stainless steels (MSS) by GTAW welding, the repair welding carried out by using ER 310L as consumable filler wire. PWHT was carried out at 1100°C for 1h. The structure-property relationships of the weldments were established based on the current modes employed by utilizing combined techniques of optical microscopy, line/point and EDS analysis. Results showed that Micro-hardness along the base and HAZ regions increased after PWHT as compared to in state of as-welded. After welding process, microstructure photographs of weld-metal region revealed two phase the vermicular δ-Ferrite and γ-austenite matrix. HAZ region consisted of tempered lath martensite with carbides. Line/Point analysis revealed the direction of segregation, whereas chromium was increased in core and depleted in boundary, while nickel was depleted in core and increased in boundary, this support the δ – ferrite was primarily solidified.

Paper ID: 305

Synthesis of MWCNTs from Methanol/Butanol Mixture by Catalytic Chemical Vapor Deposition and Application to Synthesized Dye Sensitizer Solar Cell

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Abstract. In this research, the MWCNTs (multi-wall carbon nanotubes) were produced with the assistance of CVD (chemical vapor disposition) at 700°C from mixture of methanol/Butanol (1:1) with using ferrocene as catalyst for growth. The synthesized product was characterized by energy dispersive X-ray spectrometry, Raman spectrometry, X-ray diffraction and Scanning electron microscopy. The synthesized MWCNTs were impregnated with TiO2 and manufacturing Dye-sensitized Solar cells (DSSCs) with two different ratios 0.005% and 0.01% and were characterized after and before thermal treatment by measuring band gab I/V measurements with make image for TiO2 after and before impregnated. The results showed that 0.01% MWCNT/TiO2 was more active to synthesized DSSC than 0.005%MWCNT/TiO2.

Paper ID: 306

Analytical Model of Transient Thermal Effects in Microchip Laser Crystal

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Abstract. Transient thermal model of temperature and stress field in solid-state microchip laser crystal was obtained analytically using integral transform method. The effect of changing the face convection heat transfer coefficients were studied. Results revolve that at a pump power of 3 W, the maximum temperature rise is 27.78 C located on the center of the pump face. By calculating the additional optical path length, the thermal focal length of 1.2124 m was obtained under the Gaussian pump distribution. The effect of increasing the face and the edge heat transfer cooling coefficients with different pump power were also studied and it was found that increasing cooling coefficients can lead to decrease time to reach steady state and can reduce temperatures and stresses distribution in laser rod. Good agreement was obtained by comparing the result of this work with other earlier works in literature.

Paper ID: 307

A Comparative Study on Inhibitory Action of Ficus carica, Olea europaea and Ziziphus spina-christi Plant Leaves on Carbon Steel in Sulfuric Acid Medium

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Abstract. Ficus carica (FC), Olea europaea (OE) and Ziziphus spina-christi (ZSC) leaves as green corrosion inhibitors for carbon steel in sulfuric acid solution were studied by gravimetric techniques at 293 to 333 K. The results obtained from experimental weight loss data revealed the order of inhibition efficiency as Olea europaea > Ficus carica (FC) > Ziziphus spina-christi (ZSC). Through the three leaves plants studied, the maximum efficiency was found in Olea europaea leaves showed 96.1% at its optimum concentration 13 g/l. Inhibition efficiency IE increased on increasing inhibitor concentration but decreased with rise in temperature and immersion time which suggested that the mechanism is physical adsorption of the leaves constituents on the carbon steel surface. The adsorption of Ficus carica, Olea europaea and Ziziphus spina-christi leaves onto the carbon steel surface obeyed Langmuir adsorption isotherm.

Paper ID: 308

The Reolghy Effect of Nano-MgO on Hydration Process and Some Cement Mortar Properties

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Abstract. The aims of this work are study the influence of reologhy of nano-MgO on some durable as well as strengthen characterization of cement mortar such as: porosity, bulk density, water absorption and specific compressive strength at different percentage replacement of nanoMgO particles (0, 0.25, 0.5, 1.0 and 1.5%) wt. %, had been replacement to cement weight and constant (W/C=0.45). Physical properties of the prepared specimens had been measured and evaluated after different curing times (7,14,28,60and 91) days, compressive strength also had been performed after (all curing times).The results illustrates direct decreasing in porosity, water adsorption and increasing in density and compressive strength with increasing the reolghy ofnano-MgO,.Maximum decreasing in porosity, total water adsorption comparing with control cement mortar were (38.3)%,and(38.4)% respectively at(1.0)% of nano MgO substation replacement ,while maximum increasing in density, the compressive strength comparing with control cement mortar were(14.7)% and (23.52)% respectively, also at (1.0) % of nano MgO replacement.

Paper ID: 311

Predicting the Effects on Zirconium Oxide and Silver on the Properties of Polymethylmethacrylate

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Abstract. The polymethylmethacrylate are enhancement using mixture from different nanomaterials for denture applications and the study of this paper illustrate the enhancement of the properties of epoxy by addition of nano ZrO2 and Ag nano structures and examine the performance of polymer nano composites fabricate, which diffusion in polymer host matrix. The hardness, the compressive strength, the compressive modulus, ultimate tensile strength, impact strength, flexural strength, increase with increasing the additive and have the highest value for all the mechanical properties at 2.5% wt. from nano ZrO2 and Ag .The percentage of the water absorption deacreases with increasing the percentag of the additive for all samples up to 2.5% wt nano ZrO2 and Ag.

Paper ID: 312

Some critical issues on the structural properties of Nb_2O_5 nanostructure film deposited by hydrothermal technique

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Abstract. In preparing Nb_2O_5 thin films under hydrothermal conditions, deposition time among the key factors that influence the crystallinity of Nb_2O_5 nanostructures. The effect of deposition time on the crystalline, grain size, dislocation, and strain were investigated by using XRD analysis. Experiments were performed at reaction time varied time from 12 to 168 hours at 150 ^oC. Thin films were predicted through nucleation and growth reaction. As the Reaction time of mineralize increased, the grain size of the thin film became bigger and more uniform and homogeneous. It is found the optimum deposition time required to produce the best Nb_2O_5 crystalline structure is 72 hours. FESEM and Eds at optimum reaction time was also investigated which revealed the formation of a stoichiometry nanoflake films.

Paper ID: 313

Electrochemical Method for Determining Isoniazid Drug by Electrode

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Abstract. An electrolytic and a new modified electrolytic method for the manufacture of an electrode used to measure the concentration of this drug in pharmaceuticals. The battery bar and whole were used from the top and inserted into the outer circuit of the measurement. The paste formed from polyvinyl chloride, the compound of the drug substance and nitro benzene as Precipitation factor. The results were good compared to other research where the detection limit 1.33×10-7M and the correlation coefficient 0.9935

Paper ID: 314

Effect of Ultraviolet and Temperature on Mechanical Properties of Three Dimension Printed Materials

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Abstract. The aim of the research is to study the effect of temperature and ultraviolet radiation on polymers used in three-dimensional printing. Some important mechanical properties have been studied before and after exposure to accelerated weather conditions (temperature and ultraviolet radiation) by (accelerated weathering tester –model QVB\spray) device. We concentrated on three types of materials used in three-dimensional printing which are (polylactic acid, carbon filer, polylactic plus). The research problem was simulated by the high temperatures and UV radiation from the sun which is characterized the Iraqi climate throughout the year that affects the polymers in general by reducing the span and the deformity of the outer surface also lack of resistance to weather conditions. The three-dimensional printer (FDM) was used in practical term to print samples according to (ASTM D638) which leads to some mechanical properties results (yield point, max load, young modulus, max stress). The samples passed the examination stage successfully then the researchers printed the models according to the preliminary models data and the exposed to heat and ultraviolet radiation by the accelerated device of weather conditions for different periods ranging from (15, 35, 65) hours, after the exposure of the samples to the accelerated weather conditions and testing by tensile test obtained a series of results and the most important was the negative effects on the polymers used in the three-dimensional printing by these conditions also the deformation of the external surface of the samples and the lack of mechanical properties as shown in some of the following results: It was found that there was a negative effect on these materials where the highest strength was before exposure to the three substances that resisted the tension force imposed by the tensile device (1.616 for pla , 1.306 for cf , 1.802 for pla+) after exposure for 15 hours (1.364 for pla , 1.262 for cf , 1.522 for pla+ . after exposure for 35 hours (1.154 for pla , 0.6293 for cf , 0.752 for pla +) after exposure for 65 hours it became (0.988 for pla , 0.6001 for cf , 0.562 for pla+).

Paper ID: 315

Effect of Fly Ash and Styrene butadiene Rubber on the Properties of Hot Mix Asphalt

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Abstract. Asphalt cement is a solid elastic material at low pavement temperatures and fast traffic loading. It like as a liquid viscous material at high pavement temperature or slow traffic loading. This need the improving of the performance of asphalt cement to reduce fatigue cracking at low pavement temperatures and rutting at high pavement temperatures. Addition of Styrene butadiene Rubber (SBR) in asphalt pavement mixtures is one of the solutions to match the required performance standards of the pavements. (SBR) material is an expensive and its application is Unhelpful environmental aspects while fly ash is an inexpensive waste material and its application can reduce environmental pollution . The purpose of the study is to know the effect of changing fly ash ratios, Styrene butadiene Rubber (SBR) and combined (fly ash and SBR) on asphalt cement properties to justify the amount of saving made by replacement of SBR by fly ash. The performance and volumetric properties of through Marshall test method was determined .In this study different contents of fly ash and SBR were used (0%, 1%, 2%, 3%, 4%, and 5%) by weight of asphalt cement. The study conducted that asphalt stiffness increase with increase the content ratio of fly ash from asphalt cement and increase with increase the content ratio of SBR from asphalt cement. All mixtures with combined use of (Fly Ash +SBR) were lower stability than those of control mixture. So, for economic affairs, there is no justifying the proportion of SBR by fly ash.

Paper ID: 317

Removal of Chromium Ions from a Real Wastewater of Leather Industry using Electrocoagulation and Reverse Osmosis Processes

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Abstract. This study focused on treatment of real wastewater rejected from leather industry in Al-Nahrawan city in Iraq by Electrocoagulation (EC) process followed by Reverse Osmosis (RO) process. The successive treatment was applied due to high concentration of Cr^{3+} ions (about 1600 ppm) rejected in wastewater of this industry and for applying EC with moderate power consumption and better results of produced water. In Electrocoagulation process (EC), the effect of NaCl concentration (1.5, 3 g/l), current density (C.D.) (15-25 mA/cm^2), electrolysis time (1-2 h), and distance between electrodes (E.D.) (1-2 cm) were examined in a batch cell by implementing Taguchi experimental design. According to the results obtained from multiple regression and signal to noise ratio (S/N), the optimum conditions for the best removal of Cr^{3+} ions were, 1.5 g/l of NaCl, 25 mA/cm^2 of C.D., 2 h of electrolysis time, and 1.5 cm of distance between electrodes. Also, the analysis of variance (ANOVA) indicates that the percentage of contribution followed the order: C.D. (47.26 %), time (15.56 %), NaCl conc. (13.81 %), and E.D. (5.67%). The results of multiple regression model gave R^2= 88.41 % which can be considered as an acceptable agreement between predicted and experimental values. Results of confirmation test revealed that the removal efficiency of Cr^{3+} ions at optimum conditions was 88.80 %. The final collected solution from EC process was treated with RO process in which the effect of applied pressure and feed flowrate were investigated. Experimental results revealed that the highest values of Cr^{3+} Re% in permeate was 99.89 %.

Paper ID: 318

Synthesis of different manganese dioxide nanostructures and studding the enhancement of their electrochemical behavior in Zinc – MnO_2 rechargeable batteries by doping with copper

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Abstract. Different crystal forms of MnO_2 nanostructures (α, β, γ, and δ) had been successfully synthesized using hydrothermal method with different reaction time, temperature, and reacting materials. Doping the MnO_2 crystal structures with small amount of copper was accomplished. The prepared materials were characterized using XRD, FE-SEM, EDX to confirm the chemical composition and to measure the crystal size. The doped and undoped MnO_2 nanostructures were also applied in zinc-ion rechargeable batteries to study the electrochemical behavior of these nanostructures, and the results showed that samples doped with copper had better electrochmicla behavior and showed higher specific capacity in these batteries, and the highest value (306.8 mAh/g) was for Cu doped γ-MnO_2 and it is very close to the theoretical value of the MnO_2 (308.3 mA/g).

Paper ID: 319

Theoretical Investigation for Synthesis and Characterization of Two Novel Di-substituted Imidazoles Using Microwave

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Abstract. The theoretical studies were carried out for the previous synthesized compounds including [N-(4-morpholinophenyl)-4-(4-(naphthalen-2-yl)-1H-imidazol-5-yl)pyridin-2-amine] (5a) and [3-(4-cyclopropyl-1H-imidazol-5-yl)-N-(4-morpholinophenyl) aniline] (5b) and their intermediates 4a and 4b as well. The calculations were revealed that the target compound 5b is more stable than 5a based on the molecular orbital energy gap between HOMO and LUMO (ΔE= 0.1364 eV). Thermodynamic studies were calculated to investigate the formation process of compounds which showed that compound 5b has formed faster and easier than 5a (ΔHf= 129.317 Kcal/mol.k).

Paper ID: 320

The Role of Discrete Orthogonal Polynomials in Constructing Solutions of the Dynamical Equations Describing Coherent Excitation of Quantum Systems in the Field of Laser Radiation

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Abstract. The paper presents and implements an algorithm for constructing exact analytical solutions of the corresponding differential equations. The solutions are obtained without integration of the equations but with the use of methods of a discrete mathematics. The discrete Fourier transform of the equations and discrete orthogonal polynomials in Fourier space are used. Specially constructed polynomials are used and the solutions of the coherent dynamics equations of some quantum systems excited by laser radiation are given.

Paper ID: 321

Investigation the Effect of Different Nano Materials on the Compressive Strength of Cement Mortar

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Abstract. In the present work, the compressive strength assessments of cement mortar containing different amounts of ZrO2, SiO_2, Al_2O_3 and $CaCO_3$ nanoparticles have been investigated. Four different contents for each nanoparticles type were utilized as a partial replacement of cement 1%, 1.5%, 3% and 5% by the cement weight. The compressive strength was estimated for two ages 7 and 28 days. The results manifested that the specimens' compressive strength enhanced via the addition of the nanoparticles of ZrO_2 and SiO_2 to the paste of cement till 3.0% and then decreased but remained greater than the reference mix. While, the compressive strength of specimens enhanced via the ddition of the nanoparticles of Al_2O_3 and $CaCO_3$ZrO2 up to 5%. Maximum compressive strength recorded was 42.5 MPa for mixes with 3% nano SiO_2 followed by 38 MPa, 37 MPa and 33.5 MPa for mixes with 4% nano Al_2O_3, 3% nano and ZrO2 and 4% nano $CaCO_3$, respectively.

Paper ID: 322

Application of Computer Simulation Technology to Study the Impact of Water Mirror as a Contemporary Urban Elements on Environmental Behaviour in the Traditional Urban Areas

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Abstract. At present, many urban elements have been used in the traditional urban areas, in order to increase the efficiency of the environmental and functional performance of these areas. These elements have varied between urban furniture (such as a water spray fan), water mirrors and modern infrastructure and sanitation services. This study aims to study the impact of the one of these elements that can be used in the target case study (traditional Mosul city) which is a water mirror. To achieve the objectives of this study, Solene-microclimate will be used. This study concludes that the water mirror as a new type of waterscape effect reducing the surface temperature which consequently affects the microclimate around it in the Mosul City in Iraq.

Paper ID: 323

Effect of CW Green Laser Parameters on Welding Width and Strength of PMMA Polymer

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Abstract. An investigation will be performed with concerning transmission welding utilizing PMMA by using CW green laser (532nm wavelength). The effect of three variables, the welding speed (5, 15, 20mm/min), the spot size (2,2.5,3 mm), and the clamping pressure (2,6,10N) to the welding width and strength was investigated. Taguchi L9 orthogonal was used to design the experiments and optimize the result. Gray relational Analysis (GRA) method is utilized to choose the best process parameters that will provide the best property. The narrower width, formed at speed (15mm/min), spot size (2mm), and force (6N). Also, the best strength was found at speed (5mm/min), spot size (2.5mm), and force (6N).

Paper ID: 224

Study the Concentration of Radon in Water Samples using CR-39

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Abstract. In this study, irradiated radon concentrations were measured in water samples for areas close to the water stream (Al-Door, Samarra, Tikrit, Ishaqi, Hawayy, Dulouiya, Qayara) using CR-39 technology to detect and measure radon concentration in these Samples. The results showed a difference in radon concentrations and were among the highest values in the samples of water Dulouiya (541x 10^5 Bq / m^3) and lowest value in samples of water was Samarra (108 x10^5Bq / m^3), which is due to the fact that the water samples taken from areas that have been hit by shelling and military operations To increase the level of radiation.

Paper ID: 325

Evaluation the Corrosion Resistance of Pt. Thin Films for Medical Applications

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Abstract. By using magnetron sputtering deposition method Platinum (Pt.) thin films have been deposited with 17nm and 34nm thin film thickness. Power RF used for depositing 5 nm of Titanium (Ti) before depositing thin films of Pt. by DC on Ni-Cr alloy substrates. Facilities used are SEM/EDX, Ellipsometry Spectroscopy and Electrochemical potentiostat to investigate the morphology, element analysis, nanothickness, thin films roughness and electrochemical corrosion respectively. Cyclic polarization, Tafel extrapolation and open circuit potential (E o.c.p) methods on solution of artificial saliva at 37 ±1 ^oC have been used to study the resistance of localized corrosion. The results show the ability to deposit Pt. thin film with nanostructure morphology and without defect or crack with improving the localized electrochemical corrosion resistance in artificial saliva.

Paper ID: 326

Nonlinear Finite Element Analysis of Effect of Temperature on Self-Compacted Steel Fiber Reinforced Concrete Slabs

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Abstract. This research presents a theoretical study on a nonlinear finite element analysis of the influence of steel fiber on the load-carrying capacity of self-compacted slabs following different temperatures up to "600C^{o}". Specimens were examined numerically (by employing finite element program ANSYS) with two-point load under different temperature with a steel fiber content of (0, 0.2 and 0.5%). Many parameters affect were studied numerically to investigate their effect on self-compacted steel fiber reinforced concrete slabs. This study is a verification study from a part of experimental tests carried out on self-compacted slabs made with steel fiber. The research was managed on fifteen simply supported one-way reinforced concrete slabs. The main factors that influence the behavior of the slabs are slab thickness, concrete cover thickness, concrete compressive strength, and temperature. The results gained from the analytical design utilizing ANSYS are in high agreement with the laboratory data. The comparison reveals that the ANSYS nonlinear finite element application is competent in modeling and predicting the exact nonlinear performance of slabs. Parametric investigation results revealed that the concrete cover and the slab thickness have an important influence on the resistance to fire for the steel fiber self-compacted reinforced concrete slabs.

Paper ID: 327

Numerical Investigation Analysis of Variables Effect on Composite Concrete Filled Steel Tube Columns

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Abstract. The current research is an investigation to understand the performance of axially loaded concrete-filled steel tubular column. It is produced by instructing a concrete in a steel tube; it frequently adopted in the production of constructions, due to their superior earthquake and static-resistant characteristics, such as high energy, elasticity, energy consumption capacity, bending stiffness, fire characteristics simultaneously with advantageous installation technique, etc. Lately, the performance of the CFST columns has displayed of high attention to many designers, accordingly to follow the performance and load-deformation properties of composite columns; analytical finite element examination employing software (ANSYS) is presented. The analytical work firstly includes an analytical solution for the results of six researchers' experimental work and compared the analytical solution and the researcher's experimental works with many design code. The finite element results show that Ansys can predict behavior and the ultimate loads. Secondly; steel tube depends on experimental work by (*Yiyan et. al. 2014*) was used for study the effect of different variables like (thickness of the steel tube, size of column, shape of column, yield stress of steel and concrete strength) on axial deformation and ultimate load of the composite columns. Three groups of columns were investigated each group have twenty-one specimens were analyzed, which are identical in size and shape but with the different concrete type.

Paper ID: 328

Cloud Point Extraction of Paracetamol in Pharmaceutical Formation Coupling with Spectrophotometric Method

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Abstract. This method shows a novel, fast and simple method and spectrophotometric procedure for preconcentration and determination of drugs, with Paracetamol being evaluated in this manner characterized easy, fast, and high sensitivity. Method to extract and estimate Paracetamol this method .whichis based on the interaction between the drug and analytical reagent(*m*-nitroanillin)in the acid medium to form an intense reddish brown colour,ethanol-soluble consequent which can be readily extracted from micelles of a non-ionic surfactant (Triton X-114) and measured at the absorption maximum of 520 nm. The effect of salt out on the drug was also studied and the most important effect was $NaIO_4$ Where absorptivity increased significantly and increased wave length also increased intensity. The calibration curve establish the concentration range of [(5-500µg/mL] with r=0.9964 and a molar absorptivity (0.0033) $L.mol^{-1}.cm^{-1}$. Limit of detection (LOD) and limit of quantification (LOQ) are (0.058, 0.19 µg/mL) respectively, the recoveries range (0.06). The method was successfully applied to the analysis of the (Paracetamol) in its pharmaceutical preparations

Paper ID: 329

Behavior of Pile Rafts with Raft Size, Number of Piles and Different Pile Length

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Abstract.A foundation is the element of the construction, which is in direct connection with the ground that transfers the load of the construction to the ground. In this study, three-dimensional linear finite element investigations have been used to investigate the load-settlement behavior with the impact of the raft size and pile length of an axisymmetric raft and a piled raft foundation. The piles, raft, and soil have been discretized into Solid C3D8R 8-node linear brick element. Four case studies are performed in this research (the impact of raft size on the load-settlement performance of the raft foundation, the load-settlement performance of the raft and piled raft foundation were compared, the effective number of piles on the load- settlement behavior of the piled raft foundation, the effect of the length of piles on the load-settlement behavior of the piled raft foundation. The load-carrying ability of raft support is observed to develop with the improvement in the size of the raft. In this study, the finite element method is adopted through finite element package (ABAQUS 6.10) to evaluate the effect of many parameters on the load-settlement behavior of the raft and piled raft foundation in the clay soil.

Paper ID: 330

Synthesis and Study Antimicrobial Activity of Polybarbiturate Contain Triazole Ring

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Abstract: A series of Polybarbiturate containing triazole ring were prepared via the click reaction of diazido barbiturate and dipropargyl barbiturate in the presence of CuCl and Sodium ascorbate. The structures all prepared polymers were identified by using NMR and IR techniques. In aprotic polar solvents such as DMF and DMSO the end products showed that polymers have high solubility at low temperatures. Thermal stability of the all polymers were determined using thermo gravimetric analysis (TGA) and differential scanning calorimetry (DSC) which indicated that they have high Tg (124–175 °C) and good thermal stability under N2 atmosphere. The synthesized polymers were evaluated antimicrobial activity against different types strains of Gram-negative and positive bacteria and showed good significant against these bacteria.

Paper ID: 331

Effect of Nano-Silica, Silica Fume and Steel Fiber on the Mechanical Properties of Concrete at Different Ages

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Abstract. As a result of the development of concrete technology, this leads to the use of many types of additives, including Nano silica. Studies on Nanotechnology and the use of Nano-materials was now the focus of many research and studies. Concrete represents the most used construction material considering cement composition is an energy-intensive method and to reduce the CO_2 emission in atmosphere Nano silica is a proper additives material to manage environmental pollution. The object of this investigation is to examine the influences of Nano silica as a filler with percentage of (0,1,2,3 in addition 4%) by cement weight and the combined effect of silica fume with percentage of (25%) by cement weight and steel fiber of (1.0% by volume of concrete) on concrete mechanical characteristics. Nano silica and silica fume supplied the voids in the micron size of cement particle and formed a denser concrete which leads to improving the concrete mechanical properties compared to conventional concretes. Fifteen different mixtures are tested at different ages (3, 7, 14 and 28 days). Scanning Electron Micrograph (SEM) images confirm the matrix densification conclusions and prove that the hardened concrete microstructure is improved related to the influence of Nano silica.

Paper ID: 332

Flame retardancy properties and thermomechanical behavior of thermoplastic blend of Polypropylene/ Linear Low-density Polyethylene filled with nano calcium carbonate

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Abstract. The flammability of thermoplastic polymers, especially of polypropylene, considers one of the crucial global concerns because of the numerous applications of these materials in different aspects of modern life. So, the efforts of scientists are focused on developing the effective flame retardants especially with the progress in the nanotechnology. In this work, Fire retardancy performance, mechanical properties, thermomechanical behavior and thermal stability of the blend of polypropylene (PP) - linear Low density polyethylene (LLDPE) filled with nano calcium carbonate (NCC) were examined. The blend was contained on 90% PP and 10% LLDPE with different loadings of nano calcium carbonate (1.5%, 3%, 6%, 9% of PP weight). The samples were prepared by the extrusion method. The mechanical tests were tensile and bending tests while fire retardancy tests were limited oxygen index (L.O.I), U-94 protocol tests and ash content. The thermomechanical tests were thermal expansion coefficient, and thermal E-modulus. Thermal stability was examined using differential scanning calorimetry (DSC) and Differential Thermal Analysis (DTA). The results of tests showed the positive role of using nano calcium carbonate as filler for this blend. The mechanical properties, thermal expansion coefficient and thermomechanical behaviour were increasing and the highest values were recorded for 6% sample. While the maximum values of thermal stability, and fire resistance properties were recorded for 9% sample. The other nano calcium carbonate addition ratios showed varies responses. The fire retardancy properties were enhanced with using NCC filler. The results of the present work showed the success of using nano calcium carbonate with PP-LLPE blend as a fire retardant.

Paper ID: 333

Effect of Silver Nanoparticle on Structural and some (Optical, Electrical) Properties of Poly (vinyl chloride) Films

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Abstract. The purpose of this research was to study the effect incorporate silver Nano powders on the structural and (optical, electrical) properties of Polyvinyl chloride (PVC) composite material at different proportions (2 %, 4%, 6 % and 8% of its weight).The prepared samples were distinguished by (X-ray) diffraction, (FTIR) spectroscopy, SEM images and (UV-visible) spectroscopy; displays various bands characteristics of stretching with bending vibrations of (C =O, C - H, C = C, O – H and C-I) groups of and (SEM) analysis showed Ag Nanoparticles (NPs) were well dispersed in the surface of (PVC) film. The composite films morphology was studied via (FTIR) spectrum and (SEM) analysis. The optical properties for the nanocomposite films recorded at the wavelength scope (200-1100) nm. This study reveals that changes in (PVC) polymer optical properties are influenced via the doping concentration of metal Nano-powders where there was an increase in the absorption with increasing impurity percentage of (Ag) while transmission decreases, direct and indirect band gap have been estimated. These changes in optical Characterizations as function of (Ag) doping could present novel designing leading to tailor metal NPs for desirable applications.

Paper ID: 334

Removal of Ibuprofen Residues from Acidic Aqueous Solution by Bulk Liquid Membrane

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Abstract. Pharmaceuticals recently have gained recognition as a potential contaminant to concern in wastewater. A propionic acid derivatives, such as ibuprofen (IBP) are among the most frequently used anti-inflammatories. For this reason, it is necessary to develop an efficient separation technique like Bulk Liquid Membranes (BLM) to remove traces of IBP from wastewater. BLM was fully prepared to recover ibuprofen from acidic aqueous solutions in this work. In a stirred transfer cell, an experimental study of facilitated transportation of IBP using aliquat-336 was conducted. The bulk liquid membrane phase was used as a solution of the anion exchange carrier, aliquat-336 in carbon tetrachloride. The influence of parameters such initial feed concentration, feed stirring speed, membrane stirring speed, stripping phase concentration, membrane feed ratio, carrier concentration, temperature, membrane solvent type, feed phase pH were evaluated for IBP removal.The high removal efficiency of IBP from water in less than 15 minutes of contact time, under optimum working conditions, demonstrates that the BLM separation method is a very interesting advanced separation process for removing IBP from wastewater.

Paper ID: 335

Modification of Self-Compacting Colored Concrete by Adding Some Polymers

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Abstract. In this study, two polymers were added to S-CCC. The effect of these polymers was discussed on S-CCC. Polymers were polyvinyl pyrrolidone (PVP) and poly aluminum chloride (PAC). Non-destructive tests and destructive testing were tested in this study, such as pulse velocity test, rebound number test, compressive strength and modulus of rupture. Two of the colors used in this study (red and yellow), pigments are available in the domestic market and manufactured in forging countries. PVP and PAC were used in a different percentage (0, 2, 4 and 6) % and (0, 0.25, 0.5, 0.75) respectively in terms of weight of cement. In general, the best properties were observed in yellow and red concrete with 4% polyvinyl pyrrolidone.

Paper ID: 336

Manufacture of Porcelain Insulator from Iraqi Raw Material and Studying the Effect of Nano Alumina Additives on the Dielectric Properties

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Abstract. Porcelain was prepared from local raw materials; five mixtures (A, B, C, D, and E) were produced with a different weight percentage of kaolin, feldspar and silica sand. The powders were compacted as disk samples with the diameter (13 mm) by semi-dry pressing with (2 ton) applied pressure for (2minute). The specimens were sintering of (1200□C) and (1250□C) and the socking time was (2 hrs.) with the rate of rising of temperature (8□C) per minute. Physical properties (apparent porosity, water absorption, bulk density and shrinkage), mechanical properties (compressive strength and hardness) and dielectric properties were measured .with increasing of feldspar percentage the porosity, dielectric constant decrease while dielectric strength increase .the best physical, mechanical and dielectric properties which observed is the C mixture (50% kaolin, 25% feldspar,25 %silica sand). The nano alumina were additives to porcelain samples for mixture C with different weights percentage (0.5,1.0,1.5,2.0)% , dielectric properties were measured, with improvement dielectric properties and dielectric strength which were observed.

Paper ID: 337

Renewable Energy by Closed-Loop Pressure Retarded Osmosis Using Hollow Fiber Module

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Abstract. Closed-loop pressure retarded osmosis (CL-PRO) process has been used for generating renewable energy from osmotic power by using a semipermeable membrane. In this research, the sodium chloride NaCl solution with a specific molar concentration was employed as the draw solution DS, while feed solution FS was tap water. The laboratory-scale system was utilized for evaluating the CL-PRO process performance of a cellulose triacetate hollow fiber CTA-HF module within a broad range of the operational conditions such as draw solution concentration (0.1 - 0.5 M), applied hydraulic pressure difference (0 - 8 bar), flow rate of the draw solution (0.8 - 2.8 L/min), and the temperature of the DS and FS (20 - 35 □C). The effect of these operational parameters was investigated on the power density and the flux of permeated water. According to the experimental results, the power density and the flux of the permeated water increased with increasing the draw solution concentration, the flow rate of the draw solution, and the temperature of solutions. By increasing the applied hydraulic pressure on the shell-side of hollow fiber membranes (draw solution side), the water flux decreased while the produced power density increased. The maximum power density and the flux of permeated water of 0.5 M NaCl DS were approximately 0.94 W/m2 and 4.27 LMH respectively, which occurs at 8 bar hydraulic pressure.

Paper ID: 339

Mechanical Properties of Hybrid Woven Roving and Chopped Strand Mat Glass Fabric Reinforced Polyester Composites

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Abstract: In high-performance composites' manufacturing industries, glass fibers are one of the most important reinforcements with excellent mechanical properties. The aim of the work is to compare the mechanical behavior of two types of glass fiber reinforced polyester composites. Woven roving (W) and chopped strand mat glass fiber (C), for different layers (2, 4, and 6) respectively, were used to fabricate the composites by hand lay-up method. Moreover, the hybrid mixture of the two types of fibers was also fabricated for (2, 4, and 6) layers. The mechanical properties that are included in tensile, impact, and flexural. Also, the morphology properties were used to examine through scanning electronic microscope (SEM). The results show that the mechanical properties of the composites improved by increasing the number of layers of glass fibers. The composites W/UP have better impact strength, while C/UP composites exhibit better flexural behavior than W/UP. However, the hybrid composites WC/UP dominate the best mechanical properties. The morphology analyses supported the mechanical results.

Paper ID: 340

Preparation and characterization of Cr_2O_3 nanoparticle prepared by chemical method

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Abstract. Chromium oxide (Cr2O3) nanoparticles were prepared by sol-gel method, by the reaction of chromium chloride and ammonium hydroxide as procurers. Nanopowders are annealing at different temperatures (100 ^{o}C, 200 ^{o}C, and 600 ^{o}C) for 120 min and confirmed the rhombohedral structure by X-ray diffractometry analysis of the metal oxide and lattice parameters a = b = 4.926 Å and c = 13.517 Å for annealing temperature 400°C. SEM (scanning electron microscopy) and AFM (Atomic force microscopy) have been utilized used to determine the morphology with average crystallize and found increase from 51.38 nm to 104.12 nm when annealing temperature from 200 ^{o}C to 600 ^{o}C. While the optical energy gap(Eg,) was calculated

Paper ID: 341

Characterization of Electrophoretic Deposition Parameters of Nano Hydroxyapatite Coating on the Ti6Al4V Alloy Using DC Current

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1,2 and 4 Department of Production Engineering and Metallurgy/University of Technology
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Abstract. The aim of this work is to optimize EPD variables (voltage, time and concentration) using DC current depends on thickness and roughness and then characterization coating layer to select optimum condition. Electrophoresis deposition (EPD) attracts a great deal of attention to the treatment of biological materials, especially coatings in biomedical and nanomaterials as well as collections of unique and complex materials, focusing on the great smell of bone culture. The hydroxyapatite powder deposition by electrophoretic was performed on Ti-6Al-4V alloy by utilizing ethanol as a solvent under DC, to enhance the quality of the surface alloy and to meet the requirements the activity of the biological orthopedic application. The approach of Taguchi was utilized in order to determine the optimal conditions of the coatings deposition. various parameters were applied to deposit the biochemical coatings (time, concentration and voltage of powders). Solvents were used to precipitate chitosan with hydroxyapatite to be ethanol at pH 4. The surface morphology and the cross section of the coating were characterized by optical microscopes, XRD, and SEM. Optimal conditions for precipitation of hydroxyapatite (HAP) layers using roughness and thickness of 20 volts, 6 minutes, 3g / l, 40 volts, 4 min and 1 g / l on presence at room temperature. The water contact angles of samples are changed between 67.489 ° C and 35.914° C. Appropriate proportions of porosity were obtained with an average volume of 5.05-85.47 µm were obtained.

Paper ID: 342

Some of the Electrical and Thermoelectrical Properties for Cdo Thin Films Preperaerd Using Pulsed Laser Deposition Method

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Abstract. A pulsed Nd:YAG laser was used for the ablation of CdO target in the presence of low oxygen presure as reactive atmosphere in order to prepare CdO TCO's films. The electrical properties of these film has been investicated at different oxygen presure (20-100) mbar reaching to the optimum oxygen pressure at which the device could be prepared. Minimum obtained electrical resistivity found to be 7.56×10–3.cm at 80 mbar of oxygen ambient without using post-deposition heat treatment. The thermoelectrical properties revealed the formation of n- type semiconducting material.

Paper ID: 343

Tribological and Mechanical Properties Investigation of 3D Printed Polymers Using DLP Technique

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Abstract. Experiments have been accomplished to determine the tribological and mechanical properties of parts fabricated utilizing 3D printing based digital light processing (DLP). The effect of print orientation angle on the friction and wear properties as well as the tensile strength was studied, which revealed anisotropic behavior. The 3D printed specimens were subjected to post-processing with heating and UV light to achieve better cured surface finish for the tensile, friction, and wear tests. Due to its relevance, the surface roughness was evaluated as well. Tribological testing results reported that the post-processing leads up to smaller wear depth and greater coefficient of friction for the specimens as compared to the non-post processed samples. Mechanical experiment results indicated that tensile stress of DLP 3D printed test pieces was improved by post-processing. In contrast, the tensile strain was much better for the specimens without post-curing process. Furthermore, the surface structure of the worn area after tribology test for various print orientation angle specimens has been discussed.

Paper ID: 344

Galangin Enhances Gold Nanoparticles as Anti-Tumor Agents against Ovarian Cancer Cells

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Abstract. Galangin is a flavonoidfrom the root of Alpinia officinarum. It has novel anticancer properties. In the current study, ovarian cancer cells SKOV3 were treated with galangin alone, galangincombined with Gold nanoparticles (AuNPs) and AuNPsalone, and cytotoxic activity of these agentswas investigated using MTT viability assay. The expression of apoptosis-related genes p53, caspase-8 was studied usingRealtime PCR assay. Galangin concentrations were tested atdifferent.AuNPsconcentrations was6.25, 12.5, 25, 50 and 100 µg/ml. The study of geneexpression showed significant effects on p53, caspase8 in ovarian carcinoma cells.The results of the current study refer to galangin-AuNPs combination issynergistic againsttoovarian carcinomato induce cytotoxicity and cell death via apoptosis, this mechanism enhancingexpression p53, caspase-8. The effects of galangin, AuNPs, combination therapy have potential clinicaluse in the future and could bean alternative way to the conventional chemotherapy drug.

Paper ID: 345

The Influence of Laser Heating on the Performance of Silicon Solar Cell with Plasmonic Ag Nanoparticles

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Abstract. Have been prepared silver nanoparticles (Ag NPs) as colloidal in water by pulsed laser ablation (PLA) method at optimum pulses energy. The (Ag NPs) were deposited over the Silicon solar cell surface using a spraying coating, and then the coated Si-surface was irradiated by successive overlapping pulses at optimum energy. The spectrum (190-1100 nm) was done to study the optical properties of Ag colloidal solution and its spectra exhibit the characteristic absorption bands with a peak located around the typical value for Ag NPs. Surface morphology of the enhanced Silicon solar cell was examined prior and next laser heating processes. Also, the measurements and calculations showed that the short circuit current Jsc, the overall efficiency η and spectral response Rλ enhanced after these processes above the silicon surface of the solar cell. The relative increase in Jsc was (12.6%) owing to the plasmonic absorption for the incident light that trapped via the Ag NPs forward scattering and owing to the localized surface plasmons excitation in the (Ag NPs) embedded in the Si layer by the laser heating to the Si solar cell surface and the shock wave induced by laser pulses.

Paper ID: 348

Dielectric properties of kaolin with NaOH via different concentration

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Abstract. Kaolin powder ($Al_2O_3.2SiO_2.H_2O$) with average grain size 350 μm was mixed with NaOH solutions of different concentrations (2, 3, 5, 8, 16) M. The capacitance and reactance of Kaolin with different concentration of NaOH were measured using LCR meter. At frequencies smaller than 1000 Hz, the addition of sodium hydroxide to kaolin resulted in a significant increase in amplitude capacitance and the 3 M sample showed significant stimulation in the capacitance and reactance. At high frequency, the 2 M sample was the most stimulating samples. It found that the concentrations of the electrolytic solution and electrostatic forces are driven the prepared sample to increase in electric permittivity with low reactance.

Paper ID: 349

Structural and Optical Properties of NiO-ZnO Nanocomposite thin film prepared by spray pyrolysis

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Abstract. NiO-ZnO nanocomposite thin film was prepared via spray pyrolysis method at a temperature of 350 °C and concentration of 0.1M on glass substrate. Structural and optical propertis of the nanocomposite thin film have compared with the properties of both NiO and ZnO Thin films. XRD results reveals that the nanocomposite thin films are polycrystalline with ZnO hexagonal wurtzite and NiO cubic structures and no secondary phases observed. The grain size for the nanocomposite thin film as determined by SEM show a smaller grain in comparison with the grains of the pure ZnO thin films, which suggest that the nickel oxide act as grain growth inhibitor.It was also found that the highest value of the energy gap was (3.6 eV) for the NiO-ZnO films and decreased for pure ZnO and NiO thin films.

Paper ID: 350

Heavy Metals (Fe, Cu, Ni, Pb, Cd, Zn, Cr) Effects on Soil and Plants in Street Crossroads at Samarra City-Iraq

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Abstract. The study include soil samples were collected for six different sites twelve samples in the city of Samarra and collected four types of plant twelve samples and measure the extent of their impact by heavy elements, where controlled soil was taken not very impact to contamination and compare these elements with their equivalent found in the soil exposed to pollution These elements are Pb, Ni, Cd, Cr, Cu, Zn and Fe where the lowest value of (lead, nickel, cadmium, chromium, copper, zinc and iron) were (1.5, 1.6, 0.31, 2.43, 1.3, 2.06, 1.56) mg/kg respectively at different sites. While the highest value of (lead, nickel, cadmium, chromium, copper, zinc and iron) were (2.43, 2.53, 0.75, 3.83, 2.6, 3.26, 2.66) mg/kg respectively at different sites. For plants, lead lowest valuewas 1.8 mg/kg in dates and the highest value was 2.4 mg/kg in citrus fruits, cadmium lowest valuewas 0.17 mg/kg in dates and the highest value was 0.24 mg/kg in citrus, while nickel lowest valuewas 1.3 mg/kg in oranges. The highest value was 1.7 mg/kg in dates, the chromium lowest valuewas 2 mg/kg in lemon and citrus, the highest value was 2.3 mg/kg in dates, zinc lowest valuewas 1.2 mg/kg in oranges and the highest value was 1.7 mg/kg in lemon, and copper lowest valuewas 1.4 mg/kg. in oranges and citrus and the highest value was 1.6 mg/kg in lemon, while the lowest value was 1.8 mg/kg in orange and the highest value was 2.3 mg/kg in dates.

Paper ID: 351

Enhancement the Mechanical and Thermal Characteristics of Rubber Nano-composite used for Automobiles Parts

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Abstract. Vulcanisation treatment of rubber can be improved by adding recent nano-carbonic fillers based on the required applications. Therefore, choosing suitable fillers to enhance the mechanical strength and thermal stability of rubber composites has a tangible trial. Graphite derivatives have desirable characteristics which play currently an essential role in polymers industry. In this research, dispersion of graphene nanoplatelets (Gnp) in acrylonitrile butadiene rubber (NBR) were well performed. Gnp/NBR nanocomposites were characterised by rheological torque, x-ray diffraction and Fourier-Transform Infrared Spectroscopy (FTIR).Tensile strength and storage modulus were improved comparing to the pristine NBR at the optimal content 1.25 phr of Gnp. This result is attributed to the good adhesion between Gnp and NBR and enhancement in the crosslinking density in the nanocomposite structure. Glass transition temperature (T_g) improved from -8.03 to -6.28 ^oC, it is credited to the transferring of Gnp thermal characteristics to NBR chains. Thus, thermal stability of the Gnp/NBR nanocomposite increased at the optimal content (1.25 phr of Gnp). Furthermore, the onset, melting and decomposition temperatures increased too in the rubber nanocomposite. This led to raise the thermal degradation resistance which is predicting high performance of the automobiles rubber parts.

Paper ID: 352

Numerical Analysis Techniques and Model Development with SEM Evaluation to Improve the Formability of Aluminium Matrix Composite

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Abstract. Nowadays; aluminium and aluminium alloys are consider the most popular and widely used as metal matrix composites (MMC) due to their attractive properties like, light weight, low density, high damping capacity high thermal and electrical conductivity and their capability to be strengthened by precipitation. In forming process of aluminium matrix composites (AMCs), the problems of high friction and cracks during the process with high heat generation due to particles dislocation which leads to high stress generation and micro cracks which finally cause products faller need to be solved. The main objectives of this current research are to find out the main influencing factors on the formability and product quality of (AMCs) through developing a suitable model and numerical analysis. For this purposes, the commercial software (ABAQUS/CAE) has been adopted as a finite element analysis for simulation the formality behaviour of aluminium matrix composite (LM6/TiC). Experimentally, the (SEM) micrograph test was deployed to find some specific proofs and evidences on the reinforcement particles distribution and orientation with the main matrix and the bonding strength between them. As well as, it easy to analyse the composite fracture surface by (SEM) to show the reacted interfaces details. Simulation results show that the weak regions in forming of this matrix composite are those that initially affected in the starting of forming process where the particles dislocation and matrix deformations are maximum. This will leads to high values of temperature generation and stress concentrations in and around the sharp edges and semi- rounded reigns which leads to deficiency of the process and minimize the product quality. Moreover, the micrographs of (SEM) test results was revealed that the dislocations development in aluminium alloys microstructures will results in formation a new grain size with better mechanical properties. It's concluded that, the composite aluminium to be formed should be heated to elevated temperature less than melting point before forming process in order to get better surface finish.

Paper ID: 353

Evolution of GPT & GOT for albino rats treated with alloxan and polyphenols extracted fromSolanum melongena leafs

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Abstract.the aim the these study was to determinate GPT and GOT for albino rats that treated with alloxan and polyphenols extracted from solanum melongena The results showed significant differences (P <0.05)about (GOT) in group (b) which are treated with (Alloxan+ Polyphenol extract(100 mg/Kg)compared with group (c)which are treated with (Alloxan (50mg/Kg), and Statistical analysis (GPT) showed significant differences when (P <0.05) in group (b) which are treated with(Alloxan+ Polyphenol extract(100 mg/Kg)compared with group (c)which are treated with (Alloxan (50mg/Kg).

Paper ID: 354

Innovative Microbial Fuel Cell Design for Investigation of Cathode Chamber Effect and Electricity Generation Enhancement

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Abstract. In this study, a novel laboratory design of microbial fuel cell (MFC) was composed of one central anode chamber integrated with four surrounding cathode chambers and uncoated graphite was employed as anode and cathode electrodes to study the cathodic effective operation factors and to investigate the enhancement of MFC performance by using ozone gas. Cathodic operation factors that had been focused on studying their impact, including the cathode electrode surface area (156-936 cm^2) and the cathode electrode distance from the anode chamber (3-9 cm), the catholyte salt types are sodium sulfate Na_2SO_4, potassium chloride KCl, and sodium chloride NaCl at 50 mM for each, and concentration of salt (2.5-35 NaCl g/L) used in the catholyte. It was observed that the increase in the cathode electrode surface area had a significant effect to increase power generation, while the increase in electrode distance had an opposite impact. The influence of the catholyte type depends on the extent of the electrical conductivity to produce higher electrical power. Meanwhile, the increase in catholyte salt concentration inhibited the MFC performance due to decrease the dissolved oxygen concentration, especially under oxygen saturated concentration. The higher electrical power production was 23.051 mW/m^2 at 936 cm^2 surface area and NaCl concentration 15 g/L. Also, the MFC performance was improved by using dissolved ozone as an electron acceptor in reduction reaction and increased the power generated about 15 times higher than electricity generated by using dissolved oxygen. This work demonstrated that the conditions of cathodic reduction reaction play important rule along with the anodic oxidation reaction conditions on electrical power generation in MFC.

Paper ID: 355

Experimental Investigation of the Variation of Thermal Joint Resistance between Two Metallic Rough Surfaces as a Function of the Applied Pressure

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Abstract. An experimental setup was built to study the effect of applied external pressure on the thermal joint resistance (TJR) between two metallic surfaces in contact. Six cylindrical brass samples of different surface roughness values were used. Three tests of measuring TJR were done. In the first test, the joint consisted of two bare brass surfaces brought into contact under external pressure with air under atmospheric pressure used as thermal interfacial material and the pressure was varied from 0.576 MPa up to 2.146 MPa and the TJR decreased from 0.645 ^{0}C/W down to 0.356 ^{0}C/W. In the second test, the joint was formed of two brass surfaces in contact using thermal paste (RS Heat Sink Compound) as thermal interfacial material and for the same range of applied pressure, TJR decreased from 0.4391^{0}C/W down to 0.229 ^{0}C/W. While in the third test, two brass surfaces coated with thin film of aluminum were brought into contact to form the joint, and the applied pressure was varied from 0.576 MPa up to 8.032 MPa which caused the TJR to be decreased from 0.454 0C/W down to 0.319 ^{0}C/W. It was concluded that besides the effect of the applied pressure in decreasing TJR, the thermal paste that fills the gap also causes TJR to be decreased. Moreover, it is concluded that for higher thermal joint equivalent roughness values, the effect of the applied pressure is more efficient in decreasing TJR.

Paper ID: 356

FEM Analysis and Design of Permanent Magnet Disk type Magneto-Rheological (MR) Valve

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Abstract. Most of hydraulics valves are work as normally closed, while Magneto-rheological (MR) valve design to work as normally open. In this this work, developing the new design of Magneto-rheological (MR) control valve is proposed which works as normally close using permanent magnet. To achieve that the finite element analysis for proposed design of Magneto-rheological (MR) control valve is implemented to evaluate it. The new design of the proposed valve can be done using open source of magnetic finite element software (FEMM). The model of proposed Magneto-rheological (MR) control valve dimensions and all properties of assign materials to model are given to the appropriate work regions. The properties of electric circuit of magnetic coil of the proposed MR control valve are given. Mesh size is specified to the finite element model. The analysis results show the flux density of magnetic (B) and magnetic strength (H) in the effective gap of proposed valve are constant. The good performance of proposed Magneto-rheological (MR) valve design is achieved. The proposed new design is consider as normally closed MR control valve. It operates with variable flow rate (Q) when the value of current is changed, high flow rate at high current and vice versa. The proposal MR valve design can be considered as developed of Magneto-rheological (MR) control valve..

Paper ID: 358

Adioactive Pollution Studies for Soil Samples in the South of Basra Province

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Abstract. Soil samples were collected from various locations within south of Basra province for radioactive pollution studies which involves (7) locations in this region. Gamma Counter Multichannel Analyzer and LB 1200 nuclear particles detector instruments were used for measurements the radioactive pollution levels of Gamma ray , Alpha (α) and Beta (β) nuclear particles of these samples. Microscopical examinations were carried out by using OLYMPUS Optical Microscope of these samples. Results confirmed that the collected samples are contaminated with Uranium in different levels. It was found that the highest level of radioactive pollution from the south of Basra was 18 × 10-3 mRm/h. The isotopes of Uranium are decayed to Th234, Ra226 and Bi214 with values of 8.7, 5.1 and 3.2 Bq/Kg respectively were measured of these samples. Microscopical measurements of the grain samples diameters for the uncontaminated and contaminated samples with uranium of these samples are (75 and 550 μm) respectively. The comparison of this study in (2018) and previous study in (2002) of samples taken from the southern region and the center of Basra Province showed that the reduction levels of radiation pollution from (18 to 12 × 10-3 mRm/h) at the south of Basra while increasing these levels from (6 to 9 × 10-3 mRm/h) at the city center due to the movement of winds and storms that transport radioactive dust.

Paper ID: 359

Utilization of Mangosteen Pericarp (Mp) as a Natural Coagulant to Reduce Alum Dosage in the Removal of Water Turbidity

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Abstract. Natural coagulants which are naturally acquired coagulants have longed to have potential to substitute chemical coagulants due to their availability, cost effectiveness, nontoxic and biodegradable natures. In this research, the treatment of high turbidity synthetic water is carried out by coagulation method by substituting alum with Mangosteen Pericarp stock solution in a certain given percentage. This study unveils the potential and effectiveness of mangosteen pericarp as an environmentally friendly natural coagulant for the treatment of high turbid water. This is to show the efficiency of mangosteen pericarp as a substitute to alum as the experiment would substitute certain percentage of alum with mangosteen pericarp from 0% up to 25% substitution ratio. The mangosteen pericarp solution is obtained by boiling, drying, powdering and mixing with distilled water. The results obtained from the test showed that mangosteen pericarp could work efficiently work along the pH at the slow speed setting. An average of 70% to 80% turbidity removal percentage is obtained from the overall performance across 4 pH settings. In the fast setting, works best in pH 8 with a fast speed setting of 150 RPM for 3 minutes as it achieves a 98% turbidity and TSS removal percentage with 25% replacement of 10g/L of alum. Therefore, mangosteen pericarp has the potential as a coagulant to substitute alum in the water treatment process.

Paper ID: 360

Therapeutic Combination of Gold Nanoparticles and LPS as Cytotoxic and Apoptosis Inducer in Breast Cancer Cell

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Abstract. The aims of this study are to use Gold nanoparticles (GNPs) and LPS as combination cytotoxic therapy In- vitro against MCF-7 cells .The GNPs was confirmed using SEM. MCF-7 cells were treated with GNPs, and LPS at different concentration then anti-proliferative activity of these substances was studied using MTT assay. Apoptotic cells were studied using Acrydin Orange /Ethidum bromide AO/EB daul stain. Our results showed the ability of GNPs, and LPS as potential anticancer agent in breast cancer that ability inducing apoptosis. The results of current work suggest that the GNPs and LPS could be used for wide biomedical applications in future and could be offer new drug instead of chemotherapy in treatment of various types of cancer disease.

Paper ID: 361

Preparation of New Organic Compounds and the Study of Its Characteristics to Reduce the Evaporation Rate from Gasoline Tanks

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Abstract. This technique includes a new technique to reduce the loss of light hydrocarbons on the surface of gasoline. Which causes significant pollution to the environment, it includes the formation of new organic compounds (resulting from the reaction of saturated fatty acids and glycerol) to reduce the evaporation of gasoline during storage and transportation. The use of these new organic compounds reduce the evaporation rate to75% The advantage of the product is that it is very economical and uses very small amounts of (ppm) and can be applied to any type of reservoirs and has a life of frequent and high efficiency if added once and less effort and does not require many of the labor and it does not change the chemical properties of gasoline in addition to it reduce environmental pollution from evaporation and suitable for all environmental conditions.

Paper ID: 362

Effect of Hesperidin Conjugated with Golden Nanoparticles on Phagocytic Activity: *In Vitro* Study

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Abstract. Hesperidin is one of the flavonoids and it recognized to possess various biomedical potentials. Golden nanoparticles have been used in various applications covering both in vivo and in vitro biomedical diagnosis. To evaluate the stimulation activity of phagocytic Index (PI), the golden nanoparticle–conjugated hesperidin (AuNPs-Hd) were used in present study. The effect of AuNPs-Hd showed a considerable increase (85%) in contrast with PI of Gold nanoparticles which was (66%) and Hesperidin which was (51%). while, PI of blood sample that indicate the control was (20%). These data provide the evidence about the impact of AuNPs-Hsp on phagocytic cells and the nanoparticles were ingested by these cells.

Paper ID: 363

Effect of silver nanoparticles and LPS in level of IgG and IgM

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Abstract. This study designed to study the effect of silver nanoparticles, and LPS in immunoglobulin level. Silver nanoparticles and LPS were purchased from Sigma USA. SNPs and LPS were injected intraperitoneal in male mice for 3 weeks. The concentration of immunoglobulin levels was measured using single immune diffusion assay. The results of this study demonstrated that the SNPs, and LPS increases IgM, IgG level. The results of this study prove the ability of nanoparticles and LPS as immune system inducer and we could used them in future in vaccines preparation.

Paper ID: 364

Optimization of Hot Forging Process by Smart Design and Numerical Analysis Method

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Abstract. In this time being, the trend in manufacturing process is toward fast and mass productions. Forging process is classified as one of the most important methods to produce a semi and final products with suitable durability. In deformation proses like forging, the problems of high sticking and frictional contact between the workpeice and tools during and after the process need to be solved. Also it's very important to develop analysis and simulation method for optimizing the products and increase the tools life by avoiding and minimize the stresses concentration in some weak points. In this research; finite element software ABAQUS/ CAE have been conducted for analysis and simulation this deformation process. This design and manufacturing study including a forging process for a symmetric and cylindrical product with constant wall thickness. The main opjectives of this work is to develop a new design and build a virtual experimental model to minimize the generation stresses in hot forging products through controlling some parameters and variables. An axis-symmetric model of finite element (FE) was established for modelling and simulation this process. As a results; it's found that due to high deflections of tools, dies and machines which caused by the forging forces; the generation stresses and stiffness of tools are the important variables on the overall deformation process. It's concluded from this study that; it's very important to link between the manufacturing considerations and design aspects in any effective optimization. Analysis and simulations results were verified and the optimization presented was carried out.

Paper ID: 366

Synthesis and Characterization of Some Metal Ions Derived From Ciprofloxacin and Evaluation of Their Biological Activity

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Abstract. This study aims to prepare and characterize a new ligand (LT). These bonds derived from ciprofloxacin are able for coordination with the following metal ions:Cu (II), Co (II), Fe (III), Zn (II), Cr (III), Ni (II), and Mn (II); where: LT = 4- (3-carboxy-4 - ((3-carboxy-1-cyclopropyl-6-fluoro-7 (piperazine-1yil) quinoline-4 (1h) -ylidene) -6-fluoro-4-1-hydroquinone -7-yl) piperazine-1- were investigated. Analysis of elements, electrical conductivity, magnetic characteristics, melting point, UV-Vis, infrared (IR), mass, ^{1}H nuclear magnetic resonance spectrum, mass spectroscopy, and thermal analysis were employed to describe the synthesized complexes. The TGA has been checked to know the chemical composition of compounds. The measured molar conductivity values refereed to that the non-electrolytic complexes were evaluated to investigate the biological efficacy of the ligand and the synthesized complexes toward the obtained bacteria.

Paper ID: 367

Aircraft Animation and Air Route Tracing Simulation System

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Abstract. The radio communication and navigation play an important role in flight and airplane. The challenge is to locate a plane at any moment since taking off till landing. A simulation system for tracking aircraft traffic must be implemented over all its flight by determination a longitude and latitude on the earth. In this paper, a simulation system for completed flight has been done using Matlab (m_file and aerospace blockset simulink). This model animates aircraft direction and motion on 3D earth (by NED frame which attached with the model) while tracing the trajectory by an ordered list of cities with latitudes and longitudes as input. This model developed to guess the location of the aircraft at any moment during its journey within the airspace of earth. The simulation model shows how you can visualize airline routes on the globe which is helpful and active for aircraft navigation through the flight.

Paper ID: 368

Production of Sustainable Pervious Concrete by Using Waste Tires Rubber as Partial Replacement of Coarse Aggregate

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Abstract. One of the most important materials is the pervious concrete, which used by the concrete manufacturing as a Green production applies for giving pollution regulation, storm water controlling and sustainable design. The intensified attention in pervious concrete is attributed to those advantages in storm water controlling sustainable advance. This paper will present experimental information on pervious concrete with fractional substitution of coarse aggregate by waste tire rubber. Natural gravel was substituted using the volumetric method by waste rubber tires with 0, 10, 20, 30, 40 and 50% replacements for the various. Three single size used for both of natural aggregate and tire rubber chips. The density, porosity, water permeability, and compressive strength, were tested.

Paper ID: 369

Simulation Method for Redesign of Cars Hood Structure to Achieve the Requirements of Pedestrian Protection during Accidents

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Abstract. Thousands of lives the world loss every year due to Pedestrian-Cars accidents and more have injuries. Pedestrian Friendly Cars option is a viable alternative solution to reduce the pedestrian fatalities number and mitigate the injuries during accidents. This study presents a numerical simulation design method for pedestrian safety according to European Enhanced Vehicle-Safety Committee (EEVC/WG17) regulations. This structure design method based on controlling the parameters that affects the performance of hood during pedestrian accident. The hood model has been built by using Soldworks software and simulating the impact process in LS-Dyna program for tests and results analyses. Finite Elements (FE) study analysis of head impactor model used in this investigation shows the extent of pedestrian injury risk can be minimized through the selection of appropriate design of car hood structure enhancing its performance. The results of the study concluded that the proposed structure design method for car hood is an effective method to obtain the "Pedestrian Friendly Cars" which improves the performance of the hood during the impact accidents and provide better protection and more pedestrian safety.

Paper ID: 370

Anti-inflammatry activity of Gold and Graphene oxide nanoparticles In-vitro study

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Abstract. Nanoparticles (GONPs) have attracted a lot of attention during last 25 years ago because their applications such as drug delivery, biosensor, antimicrobials and anticancer activity. In the current work, the in vitro effects of Gold nanoparticles GNPs, and Graphene oxide nanoparticles GONPs as anti-inflammatory agents was measured by treated of Bone marrow derived macrophages BMDMs to LPS and ATP in the presence and absence of GNPs and GONPs. GNPs and GONPs inhibited LPS, ATP induced interleukin 6 (IL-6), and Tumor necrosis factor –alpha (TNF-α) production by BMDMs cells in a dose dependent manner. The present work exhibited that GNPs and GONPs could modulate immune system parametes and act as anti-inflammatory agents.

Paper ID: 371

2-benzhydrylsulfinyl-N-hydroxyacetamide extracted from fig: A good therapeutic agent against *Staphylococcus aureus*

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Abstract.2-benzhydrylsulfinyl-N-hydroxyacetamide was extracted from fig fruit. The fig fruits were placed in selective sequentially extract processes using soxhlet. The antibacterial activity of 2-benzhydrylsulfinyl-n-hydroxyacetamide was tested against human pathogenic Staphylococcus aureus using the Optical density assy technique to measure bacterial growth curve. The alternation in the cluster shap of treated S. aureus was measured using SEM technique. The mechanism by which 2-benzhydrylsulfinyl-N-hydroxyacetamide destroy bacterial strain was measured by the detection of reactive oxygen species (ROS) using Acridine orange-ethidium bromide (AO/EtBr) double staining method. The results of the present study demonstrated that the 2-benzhydrylsulfinyl-N-hydroxyacetamide as a new DNA-mediated antimicrobial agent. 2-benzhydrylsulfinyl-N-hydroxyacetamide was experimental new agent to breakdown the bacterial cells by %permeating% the bacterial genetic materials (nucleic acid and cytoplasmic membrane, leading to loss of cell-wall integrity, damage of nucleic acid, and increased in the permeability of bacterial cell-wall. The 2-benzhydrylsulfinyl-N-hydroxyacetamide could serve as a novel active antimicrobial agent in biomedical applications.

Paper ID: 372

Effect of extraction methods on yield, antioxidant and anticancer activity of *Aquilaria crassna*

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Abstract. *Aquilaria crassna* is an Asian traditional plant with diverse Pharmaceutical and industrial properties. Different extraction methods affect the yield and functional activities of the plant products. The present study was designed to evaluate the performances of five extraction methods (supercritical-fluid extraction SFE, hydrodistillation, steamdistillation, n-hexane and ethanol) in the stem bark of *A.crassna*. They were tested for anti-proliferative effect using four cancer cell lines and one normal cell line, and their antioxidant properties were measured using two methods (2,2'-diphenyl-1-picrylhydrazyl radical (DPPH) and ferric reducing antioxidant power (FRAP) assays). The present of essential oils was detected by transmission electron microscopy (TEM). The hydrodistillation and (SFE) extracts provided the highest yield with significant antioxidant and anticancer results.

Paper ID: 373

Natural Radionuclide Activity Concentrations and Radiological Hazard in Tea, Coffee, Wheat Fluor, and Powder Milk Consumed in Iraqi Markets

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Abstract. Twelve samples were collected, three samples for each type of tea, coffee, wheat flour and powder milk collected from Iraqi markets were analyzed by Sodium Iodide activated with Thallium NaI(Tl) detector to measure the concentrations of Cs-137, U-238, Th-232 , and K-40 in all samples. The average activity concentrations of K-40 were found to be 143.028±45.367 Bq/kg for coffee samples, 211.370 ± 15.413 Bq/kg for tea samples, 21.020 ± 2.540 Bq/kg for wheat samples, and 93.001 ± 24.580 Bq/kg for milk samples, respectively. The radiological hazards: radium equivalent, annual effective dose, internal and external hazard, life-time risk cancer, ingestion effective dose, and threshold consumption rate have been estimated, were all beneath the limit. The doses values were less than the limit value 0.30 mSv/y. Therefore, the consumption of these foods has no health risks. This process may help to obtaining basics on radiological health regulations.

Paper ID: 374

Establishing Mathematical Models to Estimate the Activities of Radionuclides (R_a) and the Lung Cancer (Lc) by Using Some Numerical Methods

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Abstract. In this paper, six mathematical models are constructed to estimate the calculated value of the activities of radionuclides (R_a). The estimations of (Ra) are conducted by relying on the uranium (u), while the value of the lung cancer per year\$10^6$ person (L_c) is done by basing on the activity concentration of radon in $Bq.m^{-3}$ (CR_n), and the value of the (L_c) is basing on the absorption effective dose equivalent (AE). These calculations are carried out by using some numerical analysis method such as; Neville's and least squares methods. The obtained results were similar to the previous studies as well as the error rates were very few and almost nonexistent.

Paper ID: 375

Nano Silver Oxide based on Insulator for Optoelectronic Device

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Abstract. The high quality, high transparent conductive nano and micro silver oxide (Ag_2O) films were deposited successfully using reactive pulsed laser deposition (RPLD) method. The optical results shows a high transparency reached to (90) % and it found to reduction sharply with the low laser fluency. The value of the optical band gab of the deposited films at the optimum preparation condition is about 3.65eV, the surface morphology give a uniforms structure with the average roughness of (1.61 nm).

Paper ID: 376

Effects of Laser wavelength on some of physical properties of Al2O3 nano films for optoelectronic device

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Abstract. The high transparent conductive, high quality nano and micro aluminum oxide (Al_2O_3) films were deposited successfully using pulsed laser deposition (PLD) method. The optical results shows a high transparency reached to (83) % and it found to reduction sharply with the low laser fluency. The surface morphology give a uniforms structure with the average roughness of (0.38 nm).

Paper ID: 377

Structure and Optical properties of HfO_2 nano films grown by PLD for optoelectronic device

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Abstract. The high purity and good transparent conductive nano and micro hafnium oxide (HfO_2) films were deposited successfully using the pulsed laser deposition (PLD) method. The optical result shows a high transparency reached to (93) %. The value of the optical band gab of the deposited films at the optimum preparation condition is about 5.3eV, the surface morphology give a uniforms structure with the average roughness of (0.3 nm).

Paper ID: 378

Preparation of Nano Indium Oxide for Optoelectronics Application

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Abstract. In the present Work, effect of substrate temperatures on the optical and morphological properties of In_2O_3 trioxide thin film has been carried out using Reactive Pulsed Laser as a Deposition technique (RPLD). 1.064µm, 7 nsec Q-switch Nd-YAG laser with 400 mJ/cm^2 laser energy's has been used to ablated pure Indium target and deposited on glass substrates . The resulted films show High transparency reached to about (85) % which found to decrease sharply with the substrate temperatures. The estimated optical band gap found to be about 3.6eV at optimum substrate temperatures (70 C^o). The FTIR results insure the formation ofIn-O vibrational bond with different vibrational intensity depending on substrate temperatures.

Paper ID: 379

Electrical and Electronic Properties of Lithium Based Thin Film for Photonic Application

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Abstract. Micro and nano structures Lithium niobate has been deposited on glass substrates using the solgel method. A spin coator was employed at 3500 RPM for 35 Sec. the prepared samples were annealed at 400, 500, 600^{o}C respectively. Obtained results show an enhancement in the structural and morphological properties with molarity concentration, the structures start up to crystallize to get a large regular distribution. The film's electrical properties revealed an improved with treatment temperature and found to increase with incident light intensity.

Paper ID: 380

$LiNO_3$ Nanophotonics Films for Optical modulators in a Review

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Abstract. In this present work, we presented the last update results for using the $LiNbO_3$ nanophotonics films as modulating application, where we have chosen a modern collection of manuscripts previously published in scientific journals in the field of optical modulators. So we are compared between the previously presented results, in order to reach the best results previously published in the use of $LiNbO_3$ nanophotonics films as modulating application.

Paper ID: 381

Study of some chemical and biological properties of sulfur spring water in Hit and Kubaisah cities

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Abstract. The study included the study of some chemical and biological properties of a number of sulfur springs permanently flowing throughout the year in the cities of Hit and Kubaisah west of Anbar province and follow-up changes that occur to these properties during different time periods and the impact of environmental factors and other factors. A variation in the concentration of salts, ions and bacterial content in spring water was observed during the study period. The study included four stations (locations) for different regions. The highest level of BOD was recorded in station (4). The same station recorded the highest concentration of NO3, NO2 and phosphate PO4, while SO4 was highest in stations (2, 4). It was noted that the water of station (1) contains the highest percentage of dissolved oxygen DO. The highest concentration of suspended solids T.S.S. was estimated in station water (2) and the highest concentration of dissolved solids T.D.S. In station water (4). The results of the study also showed the contamination of some sulfur springs with bacteria by culturing more than one type of bacterial developmental media the highest level of pollution was observed in station (2)

Paper ID: 382

Treatment of Wastewater in the city of Tikrit using Bacteria Pseudomonas spp

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Faculty of Science, Tikrit University

Abstract. The study included the ability of pseudomonas aeruginosa to reduce pollutants in the wastewater of Tikrit under different ventilation conditions (aerobic, anaerobic, facultative) for three treatment periods (2,4,6 hours) and controlled temperature (25 ° C). Physical and chemical measurements of water were performed before and after treatment. The results showed the efficiency of pseudomonsa aeruginosa in the removal of contaminants during the long treatment period (6 hours) in achieving the best results for PO4, NO3, SO4 COD, Zn and Ni in treated wastewater (60.4,43.5,61.4,82.5,87.4, 87.8%). Respectively, with significant differences from other interventions.The results of the study showed the effect of the quality of the bacteria and the different ventilation conditions and the time spent on the treatment in giving the best rates for all studied properties of wastewater and the long period of 6 hours as the best time to reduce all the studied properties.

Paper ID: 383

Substrate and Annealing Temperatures Effects on the structural results of LiNbO3 photonic films using PLD Method

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Abstract. The nanocrystalline structure of Lithium niobate (LiNbO3) thin film was prepared and deposited on the substrate made of quartz by using pulse laser deposition (PLD) technique. XRD measurements indicate that the LiNbO3 thin film structure will be more purity and more crystalline with drop the substrate temperature to 250C° because of increase the peaks intensity and disappearance the intensity of peak at 2θ=52.26 corresponding to (116) plane. And, the structure of the film will appear high crystallization with higher laser wavelength (1064nm) before the annealing process at both substrate temperature and after the annealing process at substrate temperature 300C only. Because, at the substrate temperature 250C° the film structure will be more crystallized at laser wavelength 532nm. Also, the structure of these films after the annealing process is much better than it is structure before this process due to increasing the peaks intensity.

Paper ID: 384

Effects of Oxygen gas on the Physical Properties of Tin oxide Nano Films Using Laser Light as Ablation Source

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[2]*Al-lsra'a university college Computer techniques engineering*

Abstract. The high quality, high transparent conductive nano and micro tin oxide) films were deposited successfully using reactive pulsed laser deposition (RPLD) method. The optical results shows a high transparency reached to (87) % and it found to reduction sharply with the low laser fluency. The value of the optical band gab of the deposited films at the optimum preparation condition is about 2.65eV, the surface morphology give a uniforms structure with the average roughness of (1.61 nm).

Paper ID: 385

Synthesis of nano Titanium Oxide for Photonic Application

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Abstract. Nano TiO_2 thin films on glass substrates were prepared at a constant temperature of (373 K) and base vacuum (10-3 mbar), by pulsed laser deposition (PLD) using Nd:YAG laser at 1064 nm wavelength. The effects of different laser energies between (700-1000)mJ on the properties of TiO_2 films was investigated. TiO2 thin films were characterized by X-ray diffraction (XRD) measurements have shown that the polycrystalline TiO_2 prepared at laser energy 1000 mJ. Preparation also includes optical transmittance and absorption measurements as well as measuring the uniformity of the surface of these films. Optimum parameters have been identified for the growth of high-quality TiO2 films.

Paper ID: 386

Oxygen Pressure Effects on Optical Properties of ZnO Prepared by Reactive Puled Laser Deposition

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Abstract. The deposition processes of the ZnO films have been conducted in this paper. The Q-switched Nd:YAG laser of 10 ns duration and 1800 mJ of energy was utilized to perform the deposition process of ZnO\quartz heterojunction. At different oxygen pressure, the optical properties, and constant of the deposited samples have been tested. Under 400 ^{o}C heating treatment, and different oxygen pressure the results recorded a higher transparency of more than 80% was also listed with a reduction in its value alongside with the reduction of the substrate temperature. Further, the energy bandgap has found to be 3.56 electron-volts.

Paper ID: 387

Effects of Oxygen Pressure on the Structural and Morphological Properties of ZnO prepared by RPLD

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Abstract. The deposition processes of the ZnO films have been conducted in this paper. The Q-switched Nd:YAG laser of 10 ns duration and 900 mJ of energy was utilized to perform the deposition process of ZnO\glass heterojunction. At different oxygen pressure, the optical properties, and constant of the deposited samples have been tested. Under 300 ^{o}C heating treatment, and different oxygen pressure the results recorded a higher transparency of more than 80% was also listed with a reduction in its value alongside with the reduction of the substrate temperature. Further, the energy bandgap has found to be 3.56 electron-volts.

Paper ID: 388

Effect of Fullerenes Additions on Physical - Mechanical Properties of Hot-Forged Iron-Based Powder Materials

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Abstract. It is possible to expand the applications ranges of powder material products by enhancing the performance properties of these products in addition to their manufacturability and reliability together, it's possible by materials structures modification. In this paper, the effect of fullerene (C_{60}) additives to iron-based powder material has been studied. All samples produced by Hot-Forging (HF) powder materials technology. Green and HF density of the obtained samples calculated by volume / weight and Archimede's principle, respectively. The effect of technological parameters on the microstructure of carbon steels' samples was done by an ALTAMI MET-1M metallographic microscope. Tensile test executed by using of a universal testing machine UMM –5 and the microhardness (HV10) was measured by REICHERT hardness test machine. The results showed that the HF C_{60} steels samples had higher density and strength of 0.81 and 25%, respectively, with a good plasticity in comparison with graphite steels' samples.

Paper ID: 389

Workability of Fresh Concrete using Treated Alum Sludge and Limestone Dust as Filler Replacing fine aggregate: a Sustainable Approach towards Waste Management

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Abstract. Workability is a function of the rheological properties of concrete which consist of stability, consistency and compatibility, it is also attributed to the physical property of a newly mixed concrete that determines the homogeneity at which a mix will be placed in form and finished without segregation of the individual materials. The measurement of concrete workability is one of the key property of concrete that needs to be determined and performed correctly so as to ensure a quality concrete. This paper presents an experimental work of ongoing research on the effect of two different industrial waste filler (low temperature treated alum sludge filler and limestone dust filler) on the workability of normal concrete. The alum sludge waste used in this study was waste from drinking water treatment plant while the limestone dust was collected from the limestone quarry site. Both fillers were crushed and sieved to achieve a particle size of 45μm to replace fine aggregate in different percentages 5, 10 and 15. This study was carried out in order to find the definite effect or behaviour of the two filler material on the workability of fresh concrete when used as a replacement of natural fine aggregate. The workability of fresh concrete was measured using the conventional method of measuring concrete workability (compacting factor test and slump test). It was concluded that the addition of 400□C treated alum sludge with 5% replacement of fine aggregate will yield similar workability behaviour with mixture without filler. Although 5 and 10% replacement was within design parameter it is then concluded that the addition of 400□C treated alum sludge filler with 5 to 10% replacement content of fine aggregate in terms of the workability of fresh concrete is ideal and feasible to employ in concrete. Furthermore, the replacement of fine aggregate with limestone dust filler improved the workability of fresh concrete in all parameters of testing. Thus all percentage replacement content showed superior improvement in the concrete workability and said to be a good filling material for concrete.

Paper ID: 390

Effect of Celiac Disease on Humoral Immune Response and Some of the Blood Variables in Children

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Abstract. This study included patients with the disease. This immunological disease was studied to observe the effect of age on certain immunological variables. Some parameters were used to achieve this study, are l WBC and differential count, Concentration of antibodies IgA, IgM, IgG and Concentration of complement proteins type C3 and C4 / mg / 100.The results showed an increase in antibodies IgA, IgM, IgG 226.18±5.44, 120.9±2.66**,** 1170.2±21 respectively in children under two years**.**There was an increase in complement proteins(C3,C4) compared with control.

Paper ID: 392

Performance of Multistory Building under Nonlinear Static Push-Over

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Abstract. Analysis methods such as pushover and time history analysis are acceptable to check out the behavior of buildings design by codes. Pushover analysis classified within the simplified nonlinear seismic static analysis. The benefit of this analysis is to evaluate structural elements under the effects of seismic demands imposed by ground motion. Time history as dynamic linear analysis is an accurate approach to apply as acceleration as function of time. Ground plus three stories reinforced concrete building was adopted in this research to check out the effects of pushover analysis and linear time history loadings on the performance of all structural elements, which were designed without the presence of these analysis, under the effects of wind, gravity, and seismic loadings by equivalent lateral force that suggested by ASCE. The prototype building is simulated using finite elements approach by SAP2000 package using worst loading combination such as dead, live, wind and seismic loadings. The adopted loading requirements such as wind and seismic loads are based on the Iraq topography. The capacity spectrums based on ATC-40 with the spectral displacement and different values of site location are taken into accounts, and the El Centro 1940 in case of linear time history. The results for different values of site locations and performance points were discussed in case of pushover analysis and compared with that of same site locations of the analysis of time history. Based on the analysis results the shear and displacement increased as magnitudes of site location increased.

Paper ID: 393

A Novel parameter effects on optical properties of the LiNbO3 Films using Sol-Gel method

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Abstract. Lithium niobate (LiNbO3) nano and micro photonics are prepared on Silicon substrate by sol-gel method. They have been deposited at different Substrate temperatures and annealed, at 500 oC. These samples are characterized and analyzed by Ultra-Violet visible (UV-vis), respectively and PL. The presented results were indicated that the energy gaps and refractive index are consistent with the experimental results. Also, the calculated refractive index and optical dielectric constant are in agreement with experimental data.

Paper ID: 394

Electrical And Detection Properties of nano Silver Oxide Deposited by Reactive Pulsed Laser Deposition

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Abstract. In this presented paper, silver peroxide and silver oxide thin films have been prepared using Reactive Pulse Laser Deposited (RPLD) technique. Peroxide of silver has been deposited on a p-silicon substrate. Annealing of the films has been taken under vacuum above (200-600C°) to produce oxide films. The silver oxide makes the I-V characteristics. Better (the reverse current has been changed from 20μA to 16 mA) in the graph of the curve I-V characteristics, the current had changed proportional with voltage. The response sensing had been sensed more optically for green (560nm) and near IR (840nm).

Paper ID: 395

Morphological and structural Properties of Cu_2O/ 2-D photonic Silicon nano Structure for gas sensors

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Abstract. This study consists of preparation and study of the physical, optical and electrical properties of 2D-Si and Cu2O/2D-Si thin films. The 2D-Si was introduced as a substrate by (PECE), the current density is changed (10 mA and 20 mA) and etching time is (10min). The copper oxide was deposited on the 2D-Si by PLD technique using pure copper. The physical, optical and electrical properties were studied of 2D-Si and Cu_2O/2D-Si thin films to find the best thin films that could be used as gas sensor. The structure properties were studied by X-ray diffraction (XRD). All thin films were found to have multi-crystalline and cubic structures. The surface morphology is study by using atomic force microscope and field emission scanning electron microscope.

Paper ID: 396

Gold Nanoparticles in ethanol deposited on PCF for refractive index Sensors

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Abstract. This study has been included deposition of prepared the gold nanoparticles (NPs) on PCF, solutions of sucrose, NaCl and glycerol preparation for their refractive indices sensing. Synthesis of gold NPs has been accomplished by Pulsed laser ablation methodology at 532 nm and 1064 nm. While each of sucrose, NaCl and glycerol have been prepared with 10%, 20%, 30%, 40% and 50%. The etching process has been carried out after Splicing of PCF with two equal lengths of single mode fiber (SMF). Then, the gold NPs have been deposited on the etched area of PCF fiber. The free ends of SMSs where connected to 650 nm laser and optical spectrum analyser (OSA) device. The best sensitivities to the solutions refractive indices of 400.426, 397.353 and 368.852 nm/(%w/v) were obtained when the gold NPs prepared at 532 nm employed.

Paper ID: 397

Finger Vein Techniques: Survey

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Abstract. In recent years, finger vein recognition has taken a noticeable attention. It is greatly employed for many applications due to its multiple advantages; for example: small and easy to use scanning device, its accuracy and convenience compared to other hand-based biometric models. For years researcher presented promising finger vein recognition approaches, nevertheless, there are problems and challenges in finger vein localization, feature extraction and identification. In this paper, we study twenty two finger vein recognition systems and view the methods and the techniques for which these systems built to serve. the variety of methodologies of these systems are reflects the differences in accuracy and performance for which it is vital to know which presented methods and proposed ways to reduce the outcome; so that more suitable techniques to be produced for building more robust systems.

Paper ID: 398

Time Domain Signal Analysis to Detect Bearing Faults Using Motor Current Signature Analysis

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Abstract. Bearings are critical components in the rotating machinery. The need for an easy and effective fault diagnosis technique has led to increase the use of motor current signature analysis (MCSA). In this research, a fault detection system for bearings was developed and then different faults were simulated and investigated in the test rig. MCSA is utilized since it represents a reliable approach for fault recognition in rotating machinery, time domain signals analysis technique was utilized to extract some indicative features, such as such as root mean square, kurtosis and skewness. However, in addition to the machine healthy condition two fault types, which are inner race fault and outer race fault, were introduced in the test rig. Three current sensors, type SCT013, were interfaced to Arduino MEGA 2560 microcontroller and utilized together for the purpose of data acquisition, to record the motor current signals. Then, the captured signals were analyzed and different time domain features were extracted. The results showed the effectiveness of using MCSA based time domain signal analysis in detection and diagnosis different bearings faults.