BOOK OF ABSTRACTS

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ENVIRONMENTAL SCIENCE AND TECHNOLOGY

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ISBN: 978-605-66262-3-4

Book of Abstracts of

The International Conference on EnvironmentalScienceandTechnology

Editedby

Prof. Dr. Özer Çınar

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Published, 2015

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Welcometo ICOEST 2015

On behalf of the organizing committee, we are pleased to announce that the 1st International Conference on Environmental Science and Technology (ICOEST 2015) is held from September 9 to 13, 2015 in Sarajevo, Bosnia and Herzegovina. ICOEST 2015 provides an ideal academic platform for researchers to present the latest research findings and describe emerging technologies, and directions in Environmental Science and Technology. The conference seeks to contribute to presenting novel research results in all aspects of Environmental Science and Technology.

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

ICOEST 2015 is the oncoming event of the successful conference series focusing on Environmental Science and Technology. The scientific program focuses on current advances in th eresearch, production and use of Environmental Engineering and Sciences with particular focus on their role in maintaining academic level in Science and Technology and elevating the science level such as: Water and waste water treatment, sludge handling and management, Solid waste and management, Surface water quality monitoring, Noise pollution and control, Air pollution and control, Ecology and ecosystem management, Environmental data analysis and modeling, Environmental education, Environmental planning, management and policies for cities and regions, Green energy and sustainability, Water resources and river basin management.

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

Best regards,

Prof. Dr.Özer ÇINAR

Chairman of Conference

Table of Contents

ENVIRONMENTAL MANAGEMENT AND BY-PRODUCT RECOVERY IN A POTATO PROCESSING INDUSTRY

İbrahim Uyanık, Oktay Özkan

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Abstract:

In arid and semi-arid countries like Turkey, water should be reused in industrial consumptions because of the scarcity of water sources in agricultural regions. Best available technique for wastewater management in potato processing industry is reuse of water by advanced separation techniques.

Potato, one of the most planted crops of the world has two major industrial processing applications: potato-chip production, and frozen potato production. The main by-products of a potato processing industry are; 1) peels, 2) solid pieces of potato, 3) cooked products, and 4) water management wastes.

Excess use of water for washing, peeling, trimming, slicing, and blanching processes generates wastewater that contains valuable constituents like protein, and carbohydrates (mostly starch). The recovery of these materials as well as the water reuse is the best option for a good environmental management as the legislation on environmental management is more stringent day by day.

In this study, a potato processing industry was chosen for the wastewater management and water reuse, and recovery of materials. Potato processing steps were analyzed for the waste management, wastewater reuse, constituents, quantity and quality of waste materials.

The literature review of this subject showed that the best environmental management for this industry is the reuse of water and materials recovery. Wastewater management includes partial reuse of the process water from washing and peeling processes and the rest of them, separately. Studies about potato peels indicate that it can be used for dietary fibre production, food applications and cattle feed. Material recovery is also possible from process water of slicing and blanching processes for protein and starch.

Keywords: Potato, Industry, Waste, Management

HAND MADE PAPER FONT

Ebru Özbakır

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Abstract:

The most important sources that recycling of waste paper is to assess the level of developed countries. A paper can be recycled six times. When we look at the advantages of recycling and new business opportunities as well as economic and job creation is remarkable to provide water and energy savings. With this idea comes from recycled font design project. Font project include 3 different channels; video, font design and installation.

First step of the proposal is returning the waste paper to new paper. And in this set-up we shoot all of process. Finally become 3min video. Its display process of how evaluating the conversion of waste paper into new paper and material of font design.

After some modify of these papers how Experimental typography became. In this digital part is using like a type and include poster of project. Type designs include numbers, small letter, big letter, same punctuation and special characters.

Last part of this design is installation. All letters are physical fonts. Shape of paper carried out installation.

My presentation planning show Video, Font Design and Installation process of project in 3 different discipline.

Keywords: Design Process, Type Design, Recycling, Handmade, Recycled Paper

GENETIC-BASED PI CONTROLLER FOR COOLING INDEPENDENT PV SYSTEMS

Göksu Görel, Ertuğrul Çam, Murat Lüy, Zafer Civelek

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Abstract:

Photovoltaic (PV) systems are green and sustainable energy. This systems are becoming increasingly common every area. Providing cheaper day by day is the most important factor of PV systems. As known, PV systems are generally clean energy and without damage to the environment. PV sources is only solar energy. Therefore, this systems temperature is increasing in time. This result causes to a decrease in energy efficiency. In a large PV systems on the interconnected grid, this is an important factor for cost of energy. As a result, the temperature of the panel must constantly be balanced.

In this study, surface temperature on a photovoltaic cell is kept via a cooling systems (CS). Genetic Optimization based PI controller is designed for CS. Therefore, efficiency of PV systems is aimed to be increased. Firstly, PV systems can be modelled from a voltage equation at the simple equivalent circuit. Later, variable air temperature is used for an input of PV cell. For kept constant this temperature, some water flows on the PV panel with using PMDC motor. A Genetic-Based PI Controller is designed for keeping constant panel's temperature. MATLAB-Simulink are used for simulation and modelling.

Keywords: Photovoltaic Systems, Ga-Pi Control, Cooling, Genetic Algorithm.

NOISE MAPPING ON AN UNIVERSITY CAMPUS AREA: CASE STUDY FOR ISTANBUL TECHNICAL UNIVERSITY AYAZAGA CAMPUS

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Abstract:

By the help of noise mapping, the area and the amount of population which exposure more noise than regulatory limits can be detected. If it is needed, the ways of noise reduction or control can be estimated. Insulation may be applied or noise barriers may be designed. Noise maps may be done both by measurements or simulation programs. Measurements supply more reliable results but noise mapping by measurement requires a few number of sound level analyzers and experts on noise measuring which increase the costs of projects. Also it takes really long time compared to using simulation programs. Thus, the method that includes using simulation programs and after controlling by some measurements is more feasible. Therefore, in this study firstly noise maps are prepared by a simulation program called SoundPLAN and after measurements are done at 10 different and specific points by Brüel&Kjaer-Type 2250 sound level analyzer. The parts of Buyukdere Street and Istinye Street covering campus are selected as noise source. The purpose of choosing a campus area for noise mapping is that campus includes different kind of noise sensitive buildings which are used for different aims such as education, office works and socialization. Noise maps show that the campus area is as silent as it is supposed by regulatory limits. Between working hours (08:30-17:30) most of the buildings inside campus area are exposed to noise level which is lower than 65 dBA, the limit value of day time according to regulations.

Keywords: Noise Control, Noise Mapping, Sound Level Measurement

WATER QUALITY ASSESSMENT OF MERIÇ RIVER (EDIRNE, TURKEY)

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Abstract:

The Meriç River with a length of 480 km and with a catchments area of more than 53,000 km2 is the longest river of the Balkans. It flows through Turkish territory on both banks and forms the border between Greece on the west bank and Turkey on the east bank to the Aegean Sea. The Tunca River and the Ergene River, which are subjected to strong anthropogenic impacts as they passes through plenty of settlements, along industrial enterprises, farms and areas with intensive agriculture, are its chief tributaries. The aim of this study was to evaluate the water quality of Meriç River and to determine the pressure of Tunca and Ergene Rivers on the system by a statistical approach using Cluster Analysis (CA). Water samples were collected from 5 stations (2 of them from the downstream of Tuna and Ergene Rivers and 3 of them from the Meriç River) in spring season of 2015. Total of 19 physical, chemical and biological water quality parameters were measured including temperature, dissolved oxygen, % oxygen saturation, pH, conductivity, TDS, salinity, turbidity, nitrate, nitrite, ammonium, phosphate, sulfate, chemical oxygen demand, biological oxygen demand, total carbon, total inorganic carbon, total organic carbon and cyanide. According to detected data, pollution levels of the investigated rivers as follows; Ergene River > Tunca River > Meriç River. It was also determined that Ergene and Tunca Rivers reduce the water quality of Meriç River significantly after they fall. And also according to the results of CA, 3 statistically significant clusters were formed, which were corresponded to Ergene River (Cluster 1); upstream and middlestream of Meriç River (Cluster 2), downstream of Meriç River and Tunca River (Cluster 3).

Keywords: Meriç River, Ergene River, Tunca River, Water Quality, Cluster Analysis

EVALUATION OF HEAVY METAL FRACTION VALUES IN GOLDEN HORN ESTUARY

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Abstract:

The Golden Horn, also known by its modern Turkish name as Haliç, is a major urban waterway and the primary inlet of the Bosphorus in Istanbul, Turkey. The pollution of the Golden Horn began all the way back in the industrialization time. This pollution continued to increase until some time ago. Deep dredging of the estuary is still ongoing to remove more sediment and material.

In this study, heavy metal fractions of the sediment were researched. Accumulation mechanisms of heavy metals can be classified into different categories: water soluble, extractable, carbonate bound, metal bound and similar. Heavy metals present in these categories have different remobilization behaviors under changing environmental conditions. Sediment samples are obtained from recent dredging operation. In order to determination of trace elements in sediment, Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES) was used in the analysis after chemical digestion. In the result of the experiments, a range of heavy metal values were found in the estuary sediment for every heavy metal. The values are similar to other polluted areas in different countries.

Keywords: Heavy Metal, Fraction, Estuary, Sediment, Pollution

STATISTICAL APPROACHES TO EVALUATE THE FRESHWATER SEDIMENT QUALITY: A CASE STUDY OF SEYDISUYU STREAM (TURKEY)

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Abstract:

Multivariate statistical techniques have been used to assess the water and sediment quality in recent years and Factor Analysis (FA) is a powerful and one of the most widely used multivariate statistical technique used to evaluate the environmental pollution. Pearson Correlation Index (PCI) is also widely used in environmental studies as a measure of the degree of linear dependence between two variables. Seydisuyu Stream, which has an internationally important boron mine on the basin, is located on the Eskişehir Province of Turkey and exposed to an intensive agricultural, domestic and industrial pollution. Seydisuyu Stream is also one of the most important branches of Sakarya River and carries all these organic and inorganic pollution to the Black Sea through Sakarya River. The aim of the present study is to evaluate the sediment quality of Seydisuyu Stream by using mono (Pearson Correlation Index) and multivariate (Factor Analysis) statistical techniques. For this purpose, some micro and macro element accumulations (Cr, Ni, Cu, Zn, As, B, Pb, Fe, K, Mn and Mg) in sediment of Seydisuyu Stream were investigated by collected samples on the basin from 15 stations (3 of them from the Çatören Dam Lake and 2 of them from the Kunduzlar Dam Lake) in summer season of 2012. According to the results of Factor Analysis, three factors explained 90.95% of the total variance. First factor (F1) named as “Urban – Industrial Factor” explained 47% of the total variance, second factor (F2) named as “Agricultural Factor” explained 28.31% of the total variance, and third factor (F3) named as “Geological – Mining Factor” explained 15.63% of the total variance.

Keywords: Seydisuyu Stream, Sediment Quality, Heavy Metal, Statistical Evaluation, Factor Analysis

MODELLING OF RIVER DISCHARGES IN THE SOUTH-EASTERN BLACK SEA

Devran YAZIR, Ercan KÖSE

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Abstract:

In this study, development and evaluation of buoyant river plumes under the influence of the coastal currents and the guidance of topography in the south eastern Black Sea coast (Solaklı and Sürmene) rivers were analyzed. For simulation, the rivers are inputted as source of zero salinity in computer based simulation model pomsed. The river plumes are examined with realistic topography and idealized wind conditions. In order to check accuracy of the simulation, temperature, salinity, current speed and directions were measured in 22 stations and. Comparison of the measurements and modeling of currents showed good agreement. When both buoyancy and wind are employed as external forcing, the circulation is influenced by the opposing tendencies for stratification. The present findings suggest that transport of low salinity waters depends on buoyancy in the vicinity of rivers and wind components away from river mouths.

Keywords: Modelling, Blacksea

RESEARCH ON THE UTILIZATION POTENTIALS OF WIND AND SOLAR ENERGIES IN EASTERN ANATOLIA REGION OF TURKEY

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Abstract:

When the conventional energy resources and the potential of the renewable energy resources of Turkey are compared, solar and wind energies especially gain great importance. Considering the utilization of these energies in the regions of Turkey, Eastern Anatolia Region ranks one of the last places. In this research, having important places among the renewable energy resources in Eastern Anatolia Region, the potential and utilization of solar and wind energies are examined. In this context, after carrying out a research on the sources of wind and solar energies in Eastern Anatolia Region, the places where these energies can be utilized most efficiently are determined. Besides, the potential of wind and solar energies in Eastern Anatolia Region in terms of production technologies, the utilization level and method of these potentials both sole and together are discussed. Moreover, some suggestions to utilize the wind and solar energies efficiently and prevalently in Eastern Anatolia Region are put forward.

Keywords: Wind Energy, Solar Energy, The Utilization And Potential Of Energy, Eastern Anatolia Region

DETERMINATION OF GENETIC VARIATIONS BASED ON RAPD – PCR METHOD IN *EUSTIGMAEUS ERCIYESIENSIS* (ACARI: STIGMAEIDAE) POPULATIONS INHABITING ERZINCAN

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Abstract:

The genetic polymorphisms of *Eustigmaeus erciyesiensis* (Acari: Stigmaeidae) populations collected from Ahmediye and Ekşisu areas in Erzincan were determined by RAPD – PCR method (Randomly Amplified Polimorphic DNA–Polymerase Chain Reaction), the genetic distances between the individuals were shown with dendrograms and the dimensions of intraspecific variations was brought out. The random primers, OPAA08, OPAA19, OPAB01, OPAB05, OPAB18, OPAC09, OPAC17, OPAC19, OPAD10, OPAE09, OPAE12 and OPAE17 were used in the experiment. It was obtained a total of 134 bands in varying size from 100 to 4000 bp (base pairs). Total polymorphism rate was calculated as 55.2%. As a result, it was determined that intra-species genetic variations in the populations of *E. erciyesiensis* are high. With this study *E. erciyesiensis* has been analysed at molecular level for the first time in the world.

Acknowledgement: This study was financially supported by Scientific Research Fund of Erzincan University (EUBAP) with research project number FEN-A-240215-0129.

Keywords: Acari, *Eustigmaeus Erciyesiensis*, RAPD, PCR, Genetic Polymorphism.

GEOLOGICAL, MINERALOGICAL AND GEOCHEMICAL CHARACTERISTICS OF HEULANDITE/CLINOPTILOLITE DEPOSIT FROM SE ANKARA, TURKEY

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Abstract:

The pyroclastic sediments considered in this study contained various amounts of zeolite and were formed in the saline alkaline Tuzgölü Basin from alterations of dacitic volcanic materials during the Early to Late Miocene. The pyroclastic rocks are chemically composed of dacitic and andesitic rocks, with an intermediate to high silica content and a high percentage of alkali cations. Zeolitic tuffs mainly composed of heulandite/clinoptilolite (hul/cpt), chabazite, erionite, and analcime associated with smectite. Tuff layers containing heulandite/clinoptilolite (hul/cpt) layers between 40 and 95% by weight with economical potential. The clinoptilolite was thermally stable at 600 °C, whereas the heulandite collapsed and the type-2 heulandite partially collapsed. The rare earth (RE), large ion lithophile (LIL), and high-field strength (HFS) elements in the hul/cpt-rich tuffs and vitric tuffs were enriched or depleted relative to precursor rock. The δ18O and D compositions of the zeolite minerals indicated that zeolitization partially occurred by diagenetic alteration under partially closed-system at low to moderate temperatures. The SiO2 and Al2O3 contents of the hul/cpt-rich tuffs were slightly higher (SiO2/Al2O3=5.55) than in the non-zeolitic tuff (SiO2/Al2O3=5.21). The electron microprobe analyses confirmed that the hul/cpt were mostly high-silica and that the Ca-Na-rich heulandites had an intermediate composition between heulandite and clinoptilolite. The extra framework cation compositions of the hul/cpt-rich tuff were similar to the non-zeolitic tuff. The structural formula of the hul/cpt was determined to be (Si28.0-29.8Al6.2-8.0) (Mg0.8-2.1Ca0.3-2.0Na0.2-2.3K0.4-1.9Sr0.1-0.2) calculated for a 72 oxygen cell. The Si/Al ratios of the hul/cpt ranged from 3.54 to 5.03, and some chemical features with (Mg+Ca) higher or lower than (Na+K) corresponded to the type-2 and 3 of the heulandite isomorphous series. FTIR analysis showed that the investigated zeolites consisted of mostly heulandite type-2 besides of type-3. Surface area and pore size measurements of the samples were between 10.15 and 113.42 m2/g, and 1.62 and 12.42 nm, respectively. CEC of the hul/cpt-rich samples ranged from 185 to 267 meq/100g.

Keywords: Heulandite, Clinoptilolite, Turkey, Zeolite

SOME PROPERTIES AND ADSORPTION/DESORPTION CHARACTERISTICS OF NATURAL CHABAZITE IN SE OF ANKARA (CENTRAL TURKEY)

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Abstract:

Chabazite beds were observed in the north-western part of the Tuzgölü area, which is the largest interior basin in central Anatolia in the eastern Mediterranean. The chabazite beds are found either with other zeolite minerals, e.g., clinoptilolite, erionite and rarely erionite, or nearly pure zeolite mineral in different percentages in the groundmass and/or replacement of feldspars. Thicknesses of nearly pure chabazite beds varies form 1 cm to 50 cm, and laterally ranged from 5 to 20 m. The chabazite show its characteristic morphology as a pseudocubic habit with well-developed penetration twins. The chabazite show exothermic reactions at temperatures > 700 oC and lose their water at 203 oC and 395 oC, and the first one indicating that loosely water in channel and second one demonstrating the structural bound water. A continuous weight loss was seen from the TG curves throughout the heating process to ~700-800 °C due to dehydroxylation remaining water lost. Nitrogen was used for the determination of adsorption and desorption characteristic of the mineral. BET surface area of chabazite are ranged from 322.80 to 421.31 m2/g and pore size form 2.31 to 2.42 nm. Adsorption and desorption isotherms were overlap coincide with each other indicates lower the tensile strength, and also reversible and physical absorption. The sample isotherms show not significant hysteresis toward to high p/po indicate large pores and more open surface area in the mesopore, also absorption and desorption properties are thoroughly similar. Absence of significant hysteresis between adsorption and desorption isotherms may indicate that similar to the charging and discharging behavior of mesopores of the sample. Absorption and desorption value were not significantly changed in the pressure changed. CEC of the heu/cli-rich samples ranged from 185.6 to 280.9 meq/100g.

Keywords: Chabazite, Turkey, Zeolite

REDESCRIPTION OF *STIGMAEUS DEVLETHANENSIS* AKYOL AND KOÇ (ACARI, STIGMAEIDAE) FROM HARŞIT VALLEY (TURKEY) AND ITS SOME STRUCTURAL DIFFERENTIATION FROM THE KNOWN SPECIMENS

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Abstract:

Abstract: The genus *Stigmaeus* is one of the oldest and most diverse mite genera in the Stigmaeidae with 140 described species. One of them, *S. devlethanensis* Akyol and Koç was given before from the type locality, Afyonkarahisar (Turkey), and later reported from Kelkit Valley (Turkey). Some female specimens of *S. devlethanensis* were found during a faunistic study has been carried out on the mites inhabiting Harşit Valley with the purpose of contributing to the knowledge of mites in Turkey. This species was herein re-described and illustrated based on the female specimens from the valley. Some structural differences on presence of apodemal marking on propodosomal shield, dorsal ornamentation and the number of setae on leg genua II were observed.

Keywords: Acari, Stigmaeidae, *Stigmaeus*, Harşit Valley, Turkey.

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

Keywords: Acari, Stigmaeidae, *Stigmaeus*, Harşit Valley, Turkey.

DATA LOGGING CARD DESIGN TO CONTROL ENERGY FLOW IN RENEWABLE HYBRID POWER GENERATION SYSTEM WITH USING PROTEUS, ARDUINO AND LABVIEW PROGRAM

Tolga Ozer, Yüksel Oğuz, Hasan Çimen

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Abstract:

As we know energy is the main problem should be resolved in the coming years. So lots of work have been about this field. And these works include data which have to be taken from energy sources. Every project host DAQ(Data Acquisition System) inside of its.

In this work a kind of DAQ system is designed. This DAQ system is aimed to use a renewable hybrid power generation system and will be used to take this hybrid power generation data. The aim of taking these data is made the control the energy flow of hybrid system. Every design steps are explained and introduced which kind of components are used. Used programs are introduced and separately each of processing steps of programs and software logic are given.

Keywords: Renewable Energy, Energy Flow, Data Acquisition, Energy Control

IMPORTANCE OF THE MARINE SCIENCE AND CHARTING ABOUT ENVIRONMENTAL PLANNING, MANAGEMENT AND POLICIES AT THE TURKISH STRAITS

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Abstract:

The Turkey is in a good position which has covered by water and also has the gate that connected the asian and europe continental. The Turkish Straits sea area is consist of Strait of the Istanbul (Bosphorus), Strait of the Canakkale (Dardanelle) and also Sea of Marmara. The Straits of Istanbul and Strait of Canakkale are connecting the Black Sea with the Aegean Sea through by Sea of Marmara. The Turkısh Straits has a really importance from the history because of the geopolitics, strategic and geographic situations. These importance, espacially strategic one is that the only water route between the Mediterranean Sea and the Black Sea, so the Turkish Strait sea area has been the site of significant settlement area and also city of Istanbul for a long time in the past. The Turkish Straits have been governed by the Montreux convention, since the 1936. From past to recent years this gate is the most important trade way of the world cause of the oil and oil products. These economic, strategic and also trade considerations have high level risk management about maritime transportation at the Turkish Straits. For these circumstances, need to deeply survey at the Turkish Strait about marine science, find all the risk factors at the end need to shown by the charts on the bridge of the ships and coastal facility for use all the mariners. These results could have chance to make environmental planning, management and their policies for maritime transportation, decrease marine pollution and protect all the straits shoreline by the regulations which aimed at the minimising shipping accident, avoiding collisions and protecting marine environment. With this working, try to explain the marine science and their surveys importance for environmental management, planning at the Turkish Strait.

Keywords: Turkish Straits, Environmental,Chart

ELECTROCHEMICAL TREATMENT OF CARWASH INDUSTRY WASTEWATER USING AL-FE ELECTRODES

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Abstract:

The carwash industry has gained more importance in human society in order to achieve better vehicle performance in recent years. Car washing is a highly water consuming process. Developing countries have introduced environmental legislations concerning with fresh water usage in car washing process. For instance, maximum allowable fresh water consumption is 60-70 L/car in Netherlands and Scandinavian countries [1]. Wastewater from car washing stations contains pollutants such as free oil, grease, oil/water emulsion, sand and dust, salts, surfactants, and hydraulic fluid that is discharged directly into municipal treatment plant without any treatment. These pollutants are toxic to humans and aquatic life. In this context, carwash wastewater treatment is essential to protect the ecosystem [1, 2]. Electrocoagulation is the efficient method for the treatment of wastewaters containing colloids, surfactants, organic-inorganic pollutants that can be flocculated [3]. Limited study is reported in literature about carwash wastewater treatment using electrocoagulation [3, 4]. The objective of this study is to investigate the treatability of carwash wastewater by electrocoagulation in a batch system. Effects of operating parameters such as initial pH value (2-10), current density (1-50 A/m2) and operating time (5-50 minute) were evaluated in the monopolar series (MP-S) electrode connection mode for optimum operating conditions with respect to COD, chloride, and oil-grease removal efficiencies. In addition, total operating cost and the amount of produced sludge were determined. The optimum operating conditions were found as pH:6, current density:10 A/m2, operating time: 30 min. with Al electrode and pH:8, current density:30 A/m2, operating time: 30 min. with Fe electrode, respectively. Under the optimum operating conditions, COD, chloride, and oil-grease removal efficiencies were found to be 88%, 33%, 68% for Al electrode and 88%, 50%, 89% for Fe electrode. As a conclusion, electrocoagulation performance of Fe electrode was better than that of Al electrode for removal efficiency.

Acknowledgements:

This work was supported by the Research Fund of the Istanbul University (Project number: 31389).

Keywords: Carwash Industry, Electrochemical Treatment, Electrocoagulation, Operating Parameters

ACIDIFICATION OF PHARMACEUTICAL INDUSTRY WASTEWATER IN AN ANAEROBIC SEQUENCING BATCH REACTOR (ANSBR)

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Abstract:

The pharmaceutical wastewaters contain various organic and inorganic components like spent solvents, catalysts, additives, reactants and pharmaceuticals [1]. Although pharmaceutical wastewater has traditionally been treated using physico-chemical and aerobic biological processes [2,3], the high COD concentration and low biodegradability makes anaerobic technology a potential candidate [1]. In this study, acidification of a pharmaceutical industry wastewater sourced from chemical synthesis of a nonsteroidal anti-inflammatory pharmaceutical (etodolac) was aimed. The wastewater quality characteristics were: COD:18000 mgL-1, etodolac:511 mgL-1 and pH:8.2. The AnSBR was inoculated with granule sludge of an up-flow anaerobic sludge blanket reactor treating the beer industry wastewater. Operating parameters of AnSBR were pH: 5, T: 35°C, hydraulic retention time: 1.53 days and 4 L of reactor volume. The reactor was operated with the exchange ratio of 62.5 % for 413 days. COD was increased gradually to OLR: 3.9 kgCODm-3d-1. At OLR: 1.6-2.6 kgCODm-3d-1, VFA was reached to 1350 mgL-1 with acidification rate of 30%. The COD and etodolac removal rates were 30% and 43%, respectively. At OLR: 3.9 kgCODm-3d-1, VFA production could not be observed and etodolac removal was decreased to 11%. But COD removal was increased because of sulfide bacteries. In conclusion, in accordance with BMP results, efficient operation conditions could not be achieved with increased OLR of 3.9 kgCODm-3d-1. Anaerobic membrane bioreactor systems and activated carbon adsorption are suggested for the effective COD and etodolac removal, respectively.

Acknowledgements:

The work was supported by the Scientific and Technical Research Council of Turkey (TUBITAK) under Grant no. CAYDAG-111Y078.

Keywords: Pharmaceutical Industry, Acidification, Anaerobic Sequencing Batch Reactor

EFFECT OF PRE-OZONATION ON THE TREATMENT OF PHARMACEUTICAL INDUSTRY WASTEWATER IN AN ANAEROBIC MEMBRANE BIOREACTOR (ANMBR)

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Abstract:

In recent years, pharmaceutical wastewater has become a serious source of water pollution with the rapid development of the pharmaceutical industry. Pharmaceutical wastewaters comprise complex components and have high COD values. Some pharmaceutical active compounds (PhAcs) were added to priority pollutants lists of European Union Water Framework Directive in 2014 [1]. In this context, the treatment of pharmaceutical wastewater has not focused mainly on the organic matter removal in the future. Anaerobic Membrane Bioreactors (AnMBRs) have received considerable attention for high strength wastewater in recent years because they offer high quality effluents efficiencies and complete retention biomass, regardless its settling and granulation properties [2,3]. In this study, treatability of etodolac chemical synthesis wastewater's from the pharmaceutical industry was investigated in an AnMBR system. The AnMBR reactor used in this study was operated with submerged membrane module (FM MP005 MF membrane, 66 cm2 surface area) which was run at methanogenic phase. Reactor has a 4 L volume and was operated with pH: 7, temperature: 35oC and continuous stirred and theoretical infinite sludge age for 557 days. COD was gradually increased to 2500 mg/L, 5000 mg/L, 7500 mg/L, 10000 mg/L, and 15000 mg/L. The AnMBR was successfully operated up to 15000 mg/L of COD, (85–90% COD removal) but sulphite inhibition occurred at this loading. Pre–ozonation process was applied to raw wastewater. The pre–ozonation and AnMBR system was provided the efficient operation conditions. Pre–ozonation was also effective to obtain the high etodolac removal efficiency up to 99%. The experimental studies at different COD values were investigated relationship between floc structure, the contents of EPS and SMP, surface properties and viscosity. Real–time PCR and FISH analysis were performed to determine the microbial population and effect of sulphite inhibiton on microbial population was also explained. Consequently, the removal efficiencies of COD and etodolac in this study were reached to 85–90% and almost 100%, respectively when pre–ozonation process was applied to remove inhibition occurred on the AnMBR system.

Acknowledgements: The work was supported by the Scientific and Technical Research Council of Turkey(TUBITAK) under Grant no. CAYDAG-111Y078.

Keywords: Anaerobic Membrane Bioreactor, Ozonation, Pharmaceutical Wastewater, Inhibition

MEMBRANE FOULING IN AN ANAEROBIC MEMBRANE BIOREACTOR (ANMBR): A COMPRASION BETWEEN FLAT-SHEET AND HOLLOW-FIBER MEMBRANES

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Abstract:

Anaerobic membrane bioreactors (AnMBRs) have received considerable attention in recent years. The mean advantages of AnMBRs are excellent effluent quality, low sludge production, high–treatment efficiency, small footprint, net energy production and low energy consumption. Despite these advantages, AnMBRs have significant disadvantages such as negative effects of membrane performance due to membrane fouling, reduced performance and high cleaning costs, replacing of membranes and formation of the cake structure that can not be removed [1,2,3].

In this study,a laboratory-scale AnBMR system treating pharmaceutical industry wastewater was operated for 725 days (557 days with flat-sheet membrane module, FM MP005, 168 days with hollow–fiber membrane module, P5S). The membrane fouling mechanisms were intensively investigated by the empirical membrane pore clogging models; adsorption and adsorption–membrane pore clogging models with 'Sigma–Plot' program. The membrane autopsy analysis was also conducted on the clean, fouled and stripped membrane surfaces. After 557 and 168 days of operation period, the clean, dirty and mud scraped membranes were analyzed by SEM–EDS, FT–IR, zeta potential, contact angle, confocal microscope imaging, and optic profilometer measurements of surface roughness. The sludge deposited on membrane surface was analyzed by ICP–OES, TOC, EPS and SMP analysis.

Acknowledgements

The work was supported by the Scientific and Technical Research Council of Turkey (TUBITAK) under

Grant no. CAYDAG-111Y078.

Keywords: Anaerobic Membrane Bioreactor, Flat Sheet, Hollow Fiber, Fouling

CYCLISTS APPROACH OF TRANSPORTATION VOCATIONAL SCHOOL STUDENTS, SAMPLE OF AKDENIZ UNIVERSITY

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Abstract:

Unfortunately, in our country are taken into account only motor vehicle while transportation planning. Biking get from one place to another is problematic and dangerous. Gradually evolving and growing cities are increasing the rate of motor vehicle use. With the number of increasing traffic density is one of the main reasons of environmental pollution. To promote bicycle transportation based on human power and to direct people to use environmentally friendly modes of transport and must encourage. Weight is preferred form of transportation in traffic as the use of private vehicles. Increased use of private vehicles is creating air and noise pollution. Transportation evaluate alternative modes of transport in order to solve the problem and society, people need to redirect accordingly. When examined in cars traveling through the city usually possible to see a large number of vehicles that traveled only the driver. Planning for urban transportation makes it impossible to do the bicycle transport only according to motor vehicle traffic. Cyclists ride in transportation distances, to dominate the road of vehicles, roads and traffic planning for the needs of the motor vehicle for pedestrians and cyclists is always a negative factor emerges. Leave the bike anywhere and they are considered for use by drivers on the roads dangerous for cyclists, becoming stressful and difficult and bicycle use is decreasing (4).

The overview of the University student's bicycle transport is important in planning for the future. The advantages and disadvantages of this form of transportation in the investigation were discussed. In order to create awareness of both economic and healthy sporting life it has been shown to be preferred. Bicycle for University students in the city is used as an alternative means of transportation. In many people's leisure time entertainment bike also is a tool used with the purpose of health and social activities. This paper examines the use of a means of transportation in the city with the eyes of the cycling students. These students of environmentally friendly modes of transport and aims to expand the use of bicycles by society.

Keywords: Bicycle, Transportation, Traffic, Travel, Vehicle

ESTIMATING OF KINEMATIC VISCOSITY OF ALTERNATIVE FUELS BY USING ANN

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Abstract:

It is known that viscosity is an important parameter for the fuels obtained from vegetable oils. In this study, kinematic viscosities of bioethanol, biodiesel -bioethanol blends and biodiesel produced from safflower oil have been investigated. Kinematic viscosities of bioethanol, fuel blends and safflower oil have been measured between 293-341 K with intervals of 3 K. Viscosity values of fuels have been modelled with nonlinear regression method at Arrhenius equations, they also have been modelled with artificial neural networks (ANN) method. By comparing ANN model obtained with nonlinear regression models, it has been determined which model is best.

Keywords: Biodiesel, Bioethanol, Viscosity, Regression, Ann

IN SITU MONITORING OF VANCOMYCIN RESISTANCE GENES IN SURFACE WATERS BY OLIGONUCLEOTIDE PROBES

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Abstract:

Vancomycin and teicoplanin resistance is a major cause of nosocomial infections worldwide. It is caused by various van genes located on either chromosome or transposons such as Tn1549 and its homologues. They encode proteins responsible of the moiety change on terminal pentapeptide bridge in peptidoglycan layer that eventually hinders the effectiveness of vancomycin up-to 1000 times. Although van genes are mostly found on enterococci, their homologues with high similarity are also ubiquitous in the vancomycin resistant surface water isolates other than enterococci. Previous studies revealed in our laboratory that the transfer of van genes from enterococcal to non-enterococcal isolates might frequently occur in surface waters. These findings makes the van genes a viable biomarker for the monitoring of vancomycin-resistant isolates in these waters. Therefore, this study aimed at monitoring of van harboring surface water isolates by using van-specific oligonucleotide probes. For that purpose, water samples collected from a river during the period of a year was monitored with van-specific oligonucleotide probes through in situ fluorescent hybridization technique and the images were analyzed by fluorescent microscopy. The results indicate that the van-specific oligonucleotide probes might be a potential molecular tool for in situ monitoring of vancomycin resistant isolates in surface waters.

Keywords: Vancomycin, Teicoplanin, Van Genes, Oligonucleotide Probes, Surface Waters

ESSENTIAL ELEMENTS OF INTEGRATED COASTAL ZONE MANAGEMENT AT ISTANBUL, TURKEY

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Abstract:

Coastal areas are transitional areas between the land and sea. These highly productive ecosystems create jobs, and boosts local economic growth with a higher percentage of collective and private enterprises and a larger share of production. Therefore central and governments must adopt an integrated policy and decision making process to promote a balance of uses in coastal areas. Scattered with historical attractions, heritage sites, buzzing cultural scenes and other natural resources, Istanbul is the economic and cultural capital of Turkey. The south of the city, the area at the junction of the Bosphorus Strait with The Sea of Marmara, offers great opportunities and has a vitality fed by widespread economic and cultural factors. The typical landscape of the city, its geomorphic features, oceanographic and hydrodynamic features of its waters, sea bottom characteristics, environmental pollution, make this region a critical marine environment which impacts to economy, environment and community. This panorama becomes much more complex if public organizations have not coped well with unexpected natural disasters, mostly strong earthquakes, moderate tsunamis and even flooding. This study emphasizes the essential elements of integrated coastal zone management, which is a multidisciplinary process to promote sustainable management of coastal zones, at this critical coastal environment, and its probable impacts to economy, environment and community. All objectives and probable impacts must be understood and need to be integrated by collecting information, planning, decision making, management and monitoring of implementation. Research presented here is carried out within the framework of the 111Y216 TÜBİTAK project.

Keywords: Marine Environment, Coastal Zone Management, Bosphorus Strait, Grain Size, Oceanography, Hydrodynamics, Biogeochemistry

HOUSE DUST MITES AND VARIABLES WHERE THEY LIVE IN

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Abstract:

Objective: House dust mites are one of the arachnid group, belonging to the subclass Acari in the class Arachnida. They are invisible to naked eye and change in body size from 100 to 400 µm, and found mainly in the house dust of carpets, fabric covered furniture, mattresses, pillows and sheets. Optimally, 75-80% humidity and 20-25 °C temperature are needed to survive. Dust mites as other organisms can be affected by their environmental variables. This study was conducted to investigate the effect on the number of mites in 1 gram dust of the households' variables.

Research Methods: This study was conducted in East Anatolian city, Erzincan. The houses which included to this study were elected randomly. The dust samples were collected from the carpets, fabric-covered furniture, mattresses, pillows and sheets using a vacuum cleaner with a vacuum applied on an area of 1 square meter for 2 minutes. After drying the sieved material the samples were weighed using assay balance in order to define the number of mites in per g dust and studied under a stereo microscope through lactic acid precipitation method. For light microscope studies the mites isolated from the dust samples were mounted on slides in Hoyer's medium. During the dust sampling process it was interviewed with residents and questioned features of the house. Statistical analysis of the data obtained was performed using SPSS 20.0 statistic software.

Results: We found that 66 (98.50%) of 67 houses, which the dust samples collected from, were found to be positive in terms of mites. A total of 3293 mite specimens (with min 3, max 648 and mean 49.9 in 1 g dust) were isolated from the mite positive houses. A statistically significant difference was found between the number of mites in 1 g dust and indoor temperature and humidity, outdoor temperature and humidity, surface temperature, age of the house, building status, sweep frequency, the number of individuals living at home ($p<0.05$). However, the differences were not statistically significant between the number of mites in dust gram and house warming shape, floor covering, ventilation frequency, type of cleaner used in cleaning, pets existence, carpet cleaning method and frequency ($p>0.05$).

Acknowledgement: We would like to thank to the Erzincan University Coordinatorship of Scientific Research Projects (EUBAP) for financially supporting this study with FEN-A-300614-0107 numbered project and all the households for opening their houses to us.

Keywords: House Dust Mites, Dust Gram, Variables, Erzincan, Türkiye

FROM PAPER TO E-DOCUMENTS: A DREAM OF ECOLOGICAL BALANCE

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Abstract:

Livable world is only one of the common desires of humanity. Each state and each nation should concern about the carbon footprint in the earth and transfer natural heritage to the next generations. One of the most important drawbacks for this heritage is the demand for more information depending on the production craze of the industrial world thus reflecting this information on the printed environment by using information technologies. All countries have a statistics that reflect their paper consumption per person. For example, while this amount is 68 kg for Turkey annually, it is 26 kg for Bosnia-Herzegovina. In the developed world, this ratio was more for the information production and generalization. In USA, annual paper consumption per person is 229 kg, in Germany it is 242 kg. In 2012, the amount of consumed paper all around the world is circa 400 million ton in 2012. The half of this amount is used for (51 % Packaging Paper & Paperboard), more than 1/3 is for printed documents depending on the press and public, private sector information production and (8.4 % Newsprint, 27,9 % Other Writing & Printing Papers) and remaining is for health sector.

Extending information technologies pave the way for the paper-free office dream where printed materials exist. Until the middle of the 2000, contrary to popular belief, increase in the information technologies has not decreased the paper consumption in the business world and public sector and on the contrary it increased significantly. Thanks to the some legislative arrangements as of 2010, they help work more stable in e-state and e-document management for the countries. The restructuring of e-state concept in public services both decreases the bureaucratic procedures and clearly increase the service quality in the world. The most critical factor is that document production is started to decrease. We can give the social media and the use of web technologies by the press as another factor.

In this study, striking statistics will be revealed for the paper consumption in the world. Their damages to the environment will be analyzed. Furthermore, it will be discussed how to decrease the paper consumption through use of electronical environment and widespread internet technology. The objective of this study is to reveal the contribution of the states to the nature by facilitating the use of technology and importance of emphasizing the nature in their legislation concerning the information and document management.

Keywords: Paper Consumption, Ecological Balance, E-Government

EFFECTIVENES OF CU AND AG CONTAINING AL-PILLARED LAYERED BENTONITE IN CO REMOVAL THROUGH OXIDATION

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Abstract:

The incomplete combustion of carbonaceous fuel in energy requirement is the major source of the carbonmonoxide emmision. Nowadays environmentally friendly hydrogen-rich fuels are replaced by petroleum-based fuels. The small amount of CO present in the reformer gas which fed to the polymer electrolyte fuel cell, inactives the catalyst. The carbonmonoxide oxidation is more succesfull ones in the purification of reformer gas, reduction in stack emission and in indoor air purifications. Carbon monoxide oxidation has been studied by several investigators using generally expensive catalyst such as platinium and gold containig metal oxide ones. The other way pillared clays/bentonites has several advantages as the catalyst support due to its aboundent and cheap support. Both silver and copper are more abundant and are cood canditates for the oxidation reactions.

In the present study Al-pillared layered bentonite (Al-PB) by using bentonite from Middle Anatolia region (Hançılı) was synthesized, and by the subsequent second metal impregnation, Cu@Al-PB and Ag@Al-PB were obtained. Cu/Al-PB by hydrotermal method was also synthesized. The catalytic activities of them were tested in the CO oxidation using a typical reformer gas composition. All the catalysts were found active in CO-oxidation and gave nearly the same behavior obtained by the metal oxide catalyst cited in literature. Impregnated samples yielded decreases in 50 % conversion temperature value in the carbon monoxide oxidation and showed almost around 100 % carbon monoxide conversion after 200°C. Metal impregnation to the aluminium structure resulted decrease in temperature value at 50 % conversion. Metals in the impregnated pillared structure provided surface oxygen and the carbon monoxide oxidation could follow the mechanism suggested for metal oxide catalyst.

Keywords: Pillared Layered Bentonite, Reformer Gas, Co Oxidation, Mechanism

CORRELATION OF FAULTS WITH AIRBORNE MAGNETIC ANOMALIES OF GULF OF IZMIR AND SURROUNDING, WESTERN TURKEY

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Abstract:

Recently prepared active fault map of Turkey shows strike-slip faults elongated along the SW-NE direction towards town of Izmir. The map was prepared by the Mineral Research and Exploration (MTA) of Turkey. The sea region was not mapped. Magnetic surveys can be done on land, sea surface as well as from the air. Airborne magnetic surveys are fast and efficient ways of exploring the magnetisation of the ground. If there are magnetised upper crustal or crustal substances, these can be seen on the airborne magnetic anomaly maps. Airborne magnetic anomalies were also surveyed by the MTA show intense positive anomalies aligned along the aforementioned faults. One of the faults can be observed towards Izmir. Although on the active fault map this fault cannot be observed beyond northeast of Izmir, its existence can be traced, from the airborne magnetic anomalies, through Izmir to Manisa. As a conclusion, airborne magnetic anomalies can be used to trace buried faults as such faults can be significant for predicting the earthquake potential. Furthermore, magmatic material arising from the magma can fill inside the strike-slip faults causing magnetic anomalies. Such bodies are also important for the geothermal energy potential as the internal heat of the earth ascends to near surface.

Keywords: Faults, Airborne, Magnetic, Turkey

OPERATION OF LOAD FREQUENCY CONTROL WITH PID CONTROLLER IN SINGLE AREA RENEWABLE GREEN PHOTOVOLTAIC ENERGY SYSTEMS

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Abstract:

In this study it was to investigate the frequency of load balancing power system is located in a zone of the solar system. PID is used as the controller. The classic PID controller gain values are set by Ziegler Nichols method. Loads with variable values are used to represent the network in unstable conditions depending on designed models. The power depends on weather conditions obtained from rapidly expanding solar energy systems. Radiation changes that may occur during a day are included in the power system modeling. Due to the frequency of these factors mentioned then aimed to keep within the legal limits of deviation from occurring. The modeling and simulations have shown to regulate the frequency of the control performed by the PID by the results. All modeling and simulation was obtained MATLAB / Simulink software.

Keywords: Photovoltaic Systems, Load-Frequency Control, Pid Controller

CONVENIENCE OF USING MICROWAVE IRRADIATION IN A BATCH BIODIESEL REACTOR AND PRODUCING METHYL ESTERS FROM WASTE FRYING SUNFLOWER OIL

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Abstract:

Biodiesel is a nontoxic, biodegradable and environmentally friendly renewable fuel and commonly derived from vegetable oil and animal fats. The basic obstacle to biodiesel commercialization is its high production cost and raw material supply problem. In spite of these difficulties, using waste cooking oils as a raw material and microwave irradiation for heating can reduce biodiesel production cost, since, with respect to literature, using microwave irradiation provides increasing ester yields and lessens both reaction time and energy consumption. In this study, methyl esters were produced by transesterification of waste frying sunflower oil in a 60 L capacity microwave assisted batch biodiesel reactor. For a quite short 5 minutes transesterification reaction and purification process, it was observed that the methyl ester had excellent fuel qualities such as 0.885 g/cm3 (at 15^{o}C) for density, 4.64 mm2/s (at 40^{o}C) for viscosity and 178^{o}C for flash point which met EN14214, also Fourier Transform Infrared Spectroscopy (FTIR) analysis outputs were similar to literature data which belongs to methyl esters appropriated to EN14214 standards. As a result, it is seen that compared to using vegetable oils and conventional heating systems, providing feedstock from waste oil and accomplishing biodiesel production by microwave assisted reactor can be possible to get high quality biodiesel with a fairly decreased fuel cost.

Keywords: Renewable Energy, Methyl Ester, Microwave Irradiation.

ELECTRO-OXIDATION TREATMENT FOR TURBIDITY IN PISTACHIO PROCESSING INDUSTRY WASTEWATER (PPIW)

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Abstract:

In this study, it was investigated removal of turbidity from Pistachio Processing Industry Wastewater (PPIW) by electro-oxidation. Electro-oxidation was established using Ti/Pt anodes and stainless steel cathodes in batch mode. Experimental parameters were selected as stirring speed, initial pH value and supporting electrolyte species. Removal fraction and energy consumption was calculated using experimental results of electro-oxidation of PPIW using Ti/Pt DSA type anode and stainless steel cathodes. The highest removal fraction was obtained as 0.85 at pH: 5.3 (natural), no stirring and 0.5 M NaCl supporting electrolyte concentration. Whereas, energy consumption was obtained as 203.5 kW-h/m3 at same experimental conditions.

Keywords: Electrooxidation, Ti/Pt Anode, Pistachio Processing Industry Wastewater, Support Electrolyte, Initial Ph

BATTERSEA GAS HOLDERS DEMOLITION WORKS ENVIRONMENTAL NOISE IMPACTS STUDY

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Abstract:

Battersea Gas Holders Storage Area is located in the London Borough of Wandsworth; within the site there were four redundant gasholders and associated buildings. It was proposed in 2012 that the redundant gas holders were to be dismantled. The Demolition Works comprised the dismantling of the four redundant gasholder structures, de-watering, de-sludging works and demolition of associated buildings. The Demolition Works had the potential to impact on a range of environmental and social receptors. This article focuses on the environmental noise assessment of Battersea Gas Holders Demolition Works as part of the Environmental Statement to accompany the Planning Application. This article reviews the relevant standards, methodologies and guidance to be used to assess the environmental noise impacts; describes the study area and baseline conditions existing before the Demolition Works. After identification of noise sensitive receptors, a baseline noise survey was undertaken to establish the current noise levels in the area surrounding the gas holder site, the results of which will be used as a basis on which noise levels during the demolition phases will be assessed. Then, key impacts during Demolition Works are identified and evaluated. After calculations of noise levels at noise sensitive receptors, it was discussed that without appropriate mitigation measures, the resulting levels, when combined with existing ambient noise levels, would exceed the limit values at noise sensitive receptors during Demolition Works. Noise barriers around the demolition site, limiting HGV movements to working hours, reducing number of plant that would be working during the evening and night time, specific guidance on use of concrete crusher, regularly servicing and maintenance of plant and implementing low noise attenuated exhaust systems were recommended as mitigation measures to prevent any significant negative effects; and the likely residual effects after these measures have been adopted.

Keywords: Construction Noise, Environmental Impact Assessment, Environmental Noise

REMOVAL OF HIGHLY POLLUTED WASTEWATER BY ELECTROCOAGULATION PROCESS

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YTÜ

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Abstract:

Pharmaceutical industry is one of the industries which has many problems with the treatment of industrial wastewater. These problems arise from the variety of the products and the existing processes in the production of pharmaceuticals. As a result of the product range, the pharmaceutical wastewater is rich in organic matter and has intense colour and high COD value. The pH, colour and COD of the wastewater can differ depending on the applied process, the type and the amount of the product. At the same time, the biodegradability of the pharmaceutical wastewater is quite low. For this reason biological, chemical and physicochemical treatment technologies can not always have high removal efficiencies. In the removal of COD, advanced oxidation processes are used frequently besides the traditional treatment methods.

The theory of the electrocoagulation (EC) process was first mentioned by Parekh (1979), Joffe and Knieper (2000), Mollah et al. (2001). EC is accepted to have 3 following steps as;

- forming of coagulant
- destabilization of suspended particles and breaking of emulsions and
- fusion or collection of unstable phases for the formation of the flocs.

In this study, the removal of pollutants in the wastewater of a factory which produces paracetamol, a common analgesic and antipyretic drug, as a raw material was investigated by using EC process. The parameters playing active roles (current density, time and electrode concentration) in the efficiency of the EC prosess was optimized. After the optimization of each parameter, removal efficiencies were calculated by the measurement of COD.

Keywords: Paracetamol, Advanced Oxidation Process, Electrocoagulation

THE HISTOPATHOLOGICAL ASSESMENTS OF EFFECTING FE AND ZN HEAVY METALS IN BRAIN TISSUES OF RATS

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Abstract:

Heavy metals left intensively to the environment cause different healthy problems on people by entering the food chain heavy metals. The food chain far reaching people through heavy metals in humans also causes a number of diseases and even death. Our aim is to provide determinig effect of in tissues especially in central nervous system as a result of consuming cause foods included heavy metals and water. Because of this study, the male rat specific ppm-level heavy metals (Fe and Zn) effects on brain tissue damages created recursively, and to reduce the effects of antioxidants (Juglone (5-hydroxy-1,4-naphthoquinone) were determined as the histological and immunohistochemical applications.

The damage of heavy metals, iron and zinc formed in the rats brain tissue and juglone (5-hydroxy-1,4-naphthoquinone) antioxidant activities in preventing these damages were explored with histological and immunohistochemical methods in this study. Five groups were constituded by using 35 adult male Wistar-Albino sexual rats. First group was control group (1 ml. water), second was given iron (0.3 ml. stock solution from Fe/600 ppm. + 0.7ml.water), third was given Zinc (0.2 ml. stock solution of Zn/ 400 ppm+ 0.8 ml. water), fourth was given Fe (0.3 ml. stock solution from Fe/600 ppm. + 0.7ml.water) +Antioxident Juglone (5-hydroxy-1,4-naphthoquinone), fifth was given Zn (0.2 ml. stock solution of Zn/ 400 ppm) + Antioxident Juglone (5-hydroxy-1,4-naphthoquinone) which was given to the method of rat Gavage. Hematoxylin-eosin (H&E) staining was applied to determine the histological sides of the damages of heavy metals in brain tissue and effects of given Juglon (5-hydroxy-1,4-naphthoquinone) for reducing these damages. Brain tissues were observed with light microscopic (Leica DM 500) examinations. Besides, immunohistochemical TUNNEL method was applied to determine DNA demages in cell. The results were evaluated with the program SPSS 20.00. The results in the evaluation of One-way analysis of variance (one-way ANOVA) by applying the experimental groups and control groups significant difference between groups with the testing of the Mann-Whitney U test were compared. It was observed that the number of ischemic neurons and vascular dilatation were more density in Fe group. Density of damage in brain tissue of Fe group was higher than in the control group but in the other groups were no significant difference with control group ($p<0.05$).

Keywords: Fe, Zn, Juglon, Histopathology

HISTOPATHOLOGIC RESPONSES OF ACRYLAMIDE-TREATED RAT BLADDERS

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Abstract:

Acrylamide (ACR) is a chemical used in many industries around the world and more recently

was found to be formed naturally in foods cooked at high temperatures. ACR was shown to be a neurotoxicant, reproductive toxicant, and carcinogen in animal species. The aim of the present study is to evaluate the influence of ACR treatment on the histology of urinary bladder. Rats of both genders were divided into three groups as follows: (1) Control animals, (2) ACR-I; ACR-treated (2 mg/kg-d for 90 days), (3) ACR-II; ACR-treated (5 mg/kg-d for 90 days). Urinary bladder segments were used for histopathological assessments. Studies were performed on strips separated prior to the organ chamber experiments, fixed in formalin (10%) and processed using histopathological procedures for subsequent paraffin embedding. Tissues were stained with either Hematoxylin-eosin, Masson trichrome and Toluidine blue. The preparations were examined using a light microscope for edema, congestion, inflammatory cells, microvascular proliferation, fibrosis, eosinophils, mast cells and epithelial damage. Histopathological parameters were all higher in the ACR-treated group than in the controls. These results demonstrate for the first time that ACR-treatment can induce urinary bladder injury.

Keywords: Acrylamide, Rat Bladder, Histopatalogy

MEMBRANE FOULING IN AN ANAEROBIC MEMBRANE BIOREACTOR (ANMBR): A COMPRASION BETWEEN FLAT-SHEET AND HOLLOW-FIBER MEMBRANES

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Abstract:

Anaerobic membrane bioreactors (AnMBRs) have received considerable attention in recent years. The mean advantages of AnMBRs are excellent effluent quality, low sludge production, high–treatment efficiency, small footprint, net energy production and low energy consumption. Despite these advantages, AnMBRs have significant disadvantages such as negative effects of membrane performance due to membrane fouling, reduced performance and high cleaning costs, replacing of membranes and formation of the cake structure that can not be removed [1,2,3].

In this study,a laboratory-scale AnBMR system treating pharmaceutical industry wastewater was operated for 725 days (557 days with flat-sheet membrane module, FM MP005, 168 days with hollow–fiber membrane module, P5S). The membrane fouling mechanisms were intensively investigated by the empirical membrane pore clogging models; adsorption and adsorption–membrane pore clogging models with 'Sigma–Plot' program. The membrane autopsy analysis was also conducted on the clean, fouled and stripped membrane surfaces. After 557 and 168 days of operation period, the clean, dirty and mud scraped membranes were analyzed by SEM–EDS, FT–IR, zeta potential, contact angle, confocal microscope imaging, and optic profilometer measurements of surface roughness. The sludge deposited on membrane surface was analyzed by ICP–OES, TOC, EPS and SMP analysis.

Acknowledgements:

The work was supported by the Scientific and Technical Research Council of Turkey (TUBITAK) under

Grant no. CAYDAG-111Y078.

Keywords: Anaerobic Membrane Bioreactor, Flat Sheet, Hollow Fiber, Fouling

A NEW LOCALITY OF *ATRACTOTHROMBIUM SYLVATICUM* (C. L. KOCH, 1835) (ACARI: MICROTROMBIDIIDAE) FROM TURKEY

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Abstract:

Microtrombidiidae Thor is one of the most common families with 115 genera. The genus *Atractothrombium* Feider has 14 species. In this study, adult and deutonymph specimens of *Atractothrombium sylvaticum* (C.L. Koch) were collected from soil and litter under nuts, new locality, Harşit Valley, Turkey, also larvae were obtained from the females collected from in the locality.

The following collecting methods were used: hand collecting and extraction in Berlese funnels. Under conditions of laboratory, the larvae were reared from eggs deposited by adults collected in the field. Examined material was preserved in 70% ethyl alcohol and cleared in 9% KOH. Specimens for light microscope studies were mounted on slides in Hoyer's medium. Measurements were taken in micrometers (µm) and drawings were made under a Leica DM 4000 microscope with differential interference contrast (DIC) and phase contrast.

This is the second report of the species from Turkey by this time. Previously species of given from Erzincan, Turkey, collected from altitude of 2000 m and grassy and mossy area. In this study, it is collected from 100 m above sea level, soil and litter under nuts (40°56'35'' N 38°51'13'' E, 100 m, lec. S. Adil) and also its biology and distribution were given here.

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

Keywords: Acari, *Atractothrombium*, Microtrombidiidae, Harşit Valley, Turkey

FORMATION, OCCURRENCE AND PRECURSORS OF HALOACETONITRILES IN DRINKING WATER SYSTEM: A REVIEW

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Abstract:

Over the last 30 years, many academic studies, more than 700 disinfection by-products (DBPs) have been identified in drinking waters. However, only a small fraction of those DBPs are currently regulated. Trihalomethanes (THMs) and haloaceticacids (HAAs) are two major groups of DBPs commonly found in chlorinated water. Characteristic functional group is nitrogen for nitrogenous DBPs (N -DBPs) such as haloacetonitriles (HANs), cyanogen halides (CH), and halonitromethanes (HNMs). (N-DBPs) have been reported to be much more cytotoxic and genotoxic than the regulated THMs and HAAs. HANs are an unregulated class of N-DBPs. HANs are a group of emerging halogenated N-DBPs that can be formed as by-products from the reactions between chlorine, chloramines or bromine disinfectants and organic nitrogen present in source water. From previous studies, specific HANs were determined including bromoacetonitrile (BAN), chloroacetonitrile (CAN), dibromoacetonitrile (DBAN), dichloroacetonitrile (DCAN),trichloroacetonitrile (TCAN), and bromochloroacetonitrile (BCAN). Although the total HANs levels in finished drinking water are about 10% of the THMs concentrations, the cytotoxicity and genotoxicity of some HANs are significantly higher than those of the regulated THMs or HAAs. The impact of human activity upon drinking water sources is increasingly being felt in the form of wastewater effluent and algal activity. Since these are both enriched in dissolved organic nitrogen (DON), their presence is likely to lead to raised concentrations of N-DBPs. Of the components of DON, amino acids are known to act as precursors of HANs. This paper aims to review the state of research on HANs formation in drinking water including with their types and occurrence, possible health effects and precursors.

Acknowledgment: The authors thank Technical Research Council of Turkey (TUBITAK) for their financial support [Project number: 113Y416].

Keywords: Disinfection, Disinfection By Products (Dbps), Drinking Water, Haloacetonitriles (Han),Toxicity.

IRON AND ZINC EFFECTS OF THE CEREBELLUM

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Abstract:

Heavy metals are the most important source of anorganic pollution in freshwater. Heavy metals are transported by rock pieces transported with erosion, dust transported by wing, volcanic activities, forest fires and plant cover to the water. Chemical pollutants involved to aquatic environment via atmosphere. Because these elements which are in atmosphere get to the water with the rain and wind and has an impact on the aquatic systems.

In this study, iron and zinc of heavy metals were applied one month to rats in order to identify damage of Fe and Zn accumulation. Juglone (5-hydroxy-1,4-naphthoquinone) antioxidant activities in preventing these damages were applied. In our experiment, five groups were formed by using 35 adult male Wistar-Albino rats. First group was control group (1 ml. water), second was given iron (0.3 ml. stock solution from Fe/600 ppm. + 0.7ml.water), third was given Zinc (0.2 ml. stock solution of Zn/ 400 ppm+ 0.8 ml. water), fourth was given Fe (0.3 ml. stock solution from Fe/600 ppm. + 0.7ml.water) +Antioxidant Juglone (5-hydroxy-1,4-naphthoquinone), fifth was given Zn (0.2 ml. stock solution of Zn/ 400 ppm) + Antioxidant Juglone (5-hydroxy-1,4-naphthoquinone) which was given to the method of rat Gavage. After this application, histopathological examination of cerebellum was carried out using hematoxylin eosin staining method. Besides, immunohistochemical TUNNEL method was applied to determine DNA damages in cell. The results were evaluated with the program SPSS 20.00. The results in the evaluation of One-way analysis of variance (one-way ANOVA) by applying the experimental groups and control groups significant difference between groups with the testing of the Mann-Whitney U test were compared.

Number of Apoptotic cells and Purkinje cells were observed in each group. Density of damage in cerebellum of Fe and Fe+Juglone groups were higher than in the control group but in the other groups were no significant difference with control group ($p<0.05$). Degeneration and reduction in the number of Purkinje cells were determined in Fe and Fe+Juglone groups. Degeneration in Fe+Juglone group was decreased according to the Fe group because of protective effect of the juglone.

Keywords: Cerebellum, Juglone, Iron, Zinc

FORMATION, OCCURRENCE AND PRECURSORS OF HALONITROMETHANES IN DRINKING WATER SYSTEM: A REVIEW

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Abstract:

Drinking water disinfection by-products (DBPs) result from the reaction of disinfectants, such as chlorine or chloramines, with natural organic matter (NOM) and/or bromide/iodide present in drinking water supplies. Over the last 30 years, significant amount of research efforts have been directed towards improving understanding of DBPs, and to date it is estimated that 600–700 DBPs have been reported from the use of chlorine, ozone, chlorine dioxide and chloramines. Characteristic functional group is nitrogen for nitrogenous DBPs (N-DBPs) such as haloacetonitriles (HANs), cyanogen halides (CH), and halonitromethanes (HNMs). Among these N-DBPs, HNMs received special attention because of their potential hightoxicity and their occurrence in finished waters at some treatment facilities. The concentrations of N-DBPs are generally at a lower level (ng/L to µg/L) than those of carbonaceous-DBPs (C-DBPs), but are more toxic. The recent toxicology studies conducted on emerging DBPs showed that HNMs are one of the most cyto- and genotoxic classes among the emerging DBPs, having orders of magnitude higher toxicity than trihalomethanes (THMs) and haloacetic acids (HAAs). Especially brominated HNMs is expected to be regulated by U.S. Environmental Protection Agency (USEPA). Chloropicrin is the most frequently reported HNM and was quantified at 0.2–0.5 µg/L in the US 2000–2002 and 2006–2007 surveys, respectively. Recent studies showed that dissolved organic nitrogen (DON) that could be a source of precursors for nitrogenous DBPs such as HNMs. Laboratory tests showing that ozonation before chlorination can dramatically enhance HNM formation. This paper aims to review the state of research on HNM formation in drinking water including with their types and occurence, possible health effects and precursors. Up to date information on HNMs in drinking water available in the literatures have been reviewed in this paper.

Acknowledgment: The authors thank Technical Research Council of Turkey (TUBITAK) for their financial support [Project number: 113Y416].

Keywords: Keywords:, Disinfection, Disinfection By Products (Dbps), Drinking Water, Halonitromethanes (Hnms), Toxicity.

REMOVAL OF COPPER FROM SYNTHETIC WATERS USING MODIFIED PUMICE

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Abstract:

Water contamination by heavy metals has become one of the important problems in the recent years. Copper is one of the most widely used heavy metal, finds wide use in industrial and agricultural processes. Various technologies have been used to removal of heavy metal (especially copper) from industrial wastewaters. However there have many disadvantages such as cost, low efficiency, and sludge generation. Therefore adsorption is considered as promising technology for remove wide range of pollutant from wastewaters. The use of natural materials as an adsorbent to remove heavy materials is an inexpensive alternative process to the others. Pumice is one of the natural materials used widely in the adsorption process. There has limited removal capacity due to its low surface area and surface characteristics. The surface area of the pumice can be increased by surface modification of materials. In this work, copper removal efficiencies of surface modified pumice were investigated. Firstly raw pumice materials were coated with silica and then coated with (3-Aminopropyl)-triethoxysilane (APTES). All adsorption isotherm tests were conducted in distilled-deionized water. After kinetic tests, 3 days was selected as an adsorption equilibrium time. For coated pumice about 76% copper uptakes were observed after 3 days of adsorption time (initial copper concentration: 3.0 mg/L). Raw pumice provided about 52% copper uptake after 3 days. As a general trend, the extent of copper uptakes by the coated pumice was higher than the raw pumice. Overall the results showed that coated pumice materials could be used for copper uptakes instead of raw pumice.

Keywords: Aptes, Copper, Pumice, Surface Modification

CERAMIC MEMBRANE APPLICATIONS IN INDUSTRIAL WASTEWATER TREATMENT

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Abstract:

Industrial pollution is a major threat on aqueous environment. Specific treatment necessity of industrial wastewaters is another challenge for treatment plant operators and decision makers. It is essential to select appropriate techniques especially in environmentally sensitive areas. The characteristics of industrial wastewaters depend on the type of industry. Some industrial wastewaters may contain toxic substances or high levels of organic materials/solids which make treatment processes more difficult by conventional treatment processes. Membrane filtration is an efficient alternative for the treatment of industrial effluents. Both organic and inorganic membranes have been applied for the treatment of

industrial effluents; however, ceramic membranes offer several advantages over polymeric ones such as superior thermal, chemical,mechanical stabilities and long lifetime. They work well within a pH range of 1 to 14 and can be operated at temperatures as high as 500 °C. They can also operate under high pressure differentials. These characteristics make them particularly appropriate for the treatment of industrial effluents. Nevertheless, ceramic membranes are substantially more expensive though this may be compensated by higher fluxes and extended lifetime. Moreover, the cost of ceramic membranes has been continuously reduced during the last years. Several studies have proven the feasibility of this technology for the industrial wastewater management systems. In this context, the application of ceramic membranes has been proposed as a promising technology for treatment of industrial wastewater.

Acknowledgments:

This study was financially supported by the Scientific and Technical Research Council of Turkey (TUBITAK - Project No: 114Y585).

Keywords: Ceramic Membrane, Heavy Metal, Industrial Wastewater, Separation

REMOVAL OF DICLOFENAC BY THE CATALYTIC WET PEROXIDE OXIDATION

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Abstract:

Diclofenac (DCF), an endocrine distruptor, is one of the widely used pain-reducing drugs. In this study, the removal of diclofenac (DCF) by the catalytic wet peroxide oxidation (CWPO), which is an economical and environmentally friendly advanced oxidation processes (AOPs), is investigated. Titanium-pillared bentonite (Ti-PB) was synthesized to be used as the catalyst for the CWPO. The morphology, crystal structure, and surface properties of the Ti-PB catalyst were determined by scanning electron microscopy, chemical analysis, X-ray diffraction patterns (XRD), and N2-adsorption/desorption isotherm analyses. Oxidation studies were carried out to determine the effects of the concentrations of catalyst and DCF, pH, and temperature on catalytic activity. The XRD patterns verified the formation of a delaminated structure characterized by non-parallel distribution of the clay layers during pillaring with Ti pillars, and that the titanium is incorporated into the structure as TiO2 (anatase). The results of chemical analysis also confirmed the incorporation of the titanium into the structure. The analysis of the N2- adsorption isotherms showed a type IV isotherm that indicated the presence of micro- and mesopores in the structure. The BET surface area was determined as 212 m2/g for the Ti-PB calcined at 400°C. The catalytic activity results indicate that the oxidation rate increases with increasing catalyst concentration. It was found that upon 60 minutes of oxidation, DCF removal increased from 52.6% to 99.9% when the concentration of the catalyst was increased from 1 g/L to 3 g/L. Conversely, although it was observed that the DCF removal rate increased when DCF concentrations were increased from 5 mg/L to 10 mg/L, increasing the DCF concentration beyond 10 mg/L decreased the DCF removal rate. Furthermore, it was observed that increasing the temperature also increased the DCF removal rate, whereas increasing the pH decreased the removal rate.

Acknowledgements: This study was supported by The Scientific and Technical Research Council of Turkey (TÜBİTAK/BİDEP 2209A). My research project students Elif Çanakçı, Azime Büşra Yavuz and Derya Karakuş to thank you for their contribution in experimental studies.

Keywords: Titanium-Pillared Bentonite, Diclofenac, Catalytic Wet Peroxide Oxidation

INVESTIGATION OF REMOVING COLOR WITH ACTIVATED CARBON PRODUCTION FROM CANE

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Abstract:

In this study, possibility of producing active carbon has been studied by using sedge. Purpose of the study is to obtain producing of active carbon which has good pore distribution, well adsorption feature and wide surface area by using sedge. As a liquid phase implementation, active carbon has been used to remove organic contamination, taste and smell defect in domestic and industrial waste water, and for various gas phase application and also purification of chemical product. In this working, for activation process, phosphoric acid (30%, 40%, 50% and 60% solution) and potassium hydroxide (10%, 20%, 30% solution) have been preferred as activation agent. Degrees of 300 oC, 350 oC, 400 oC, 450 oC, 500 oC, 550 oC, 600 oC have been implemented for carbonization process. Methylene blue solution has been used on performance test of obtained active carbons. Pore size distribution and pore volume have been characterized by BET surface area measurement. Besides, physicochemical properties have been determined by using FT-IR analysis and SEM images. For the best active carbon sample which has been obtained in this study, optimum conditions have been determined as 400 oC carbonization temperature and 50 % H3PO4 activation agent concentration. BET surface area of the best powder active carbon sample which is obtained in optimum conditions has been specified as 654,620 m2/g.

Keywords: Activated Carbon, Sedge, Adsorption, Color Removing

THE REMOVAL OF CYANOBACTERIAL TOXINS FROM DRINKING WATER BY ALUM, FERRIC CHLORIDE AND FERROUS SULFATE COAGULATION

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Abstract:

Eutrophication is the enhancement of the natural process of biological production caused by nutrient enrichment, mainly nitrates and phosphates. This has led to widespread of algae and cyanobacteria in fresh water and thus has had a considerable impact on water resources. In addition, some cyanobacteria genera such as Microcystis aeruginosa can produce a wide variety of toxins. The presence of toxin-producing cyanobacteria in water for human consumption or recreational purposes poses a serious hazard to humans. Coagulation is the key step in water treatment process for algae and cyanobacteria and their associated metabolites removal. The objective of this research was to investigate the efficiency of alum, ferric chloride and ferrous sulfate as a coagulant for the removal of cyanobacterial toxin, microcystin, from drinking water. In addition to this, the effect of coagulation process using alum, ferric chloride and ferrous sulfate on the Microcystis aeruginosa cell and extracellular microcystin was also assessed. The effectiveness of alum, ferric chloride and ferrous sulfate were evaluated at different coagulant dose and pH to find optimum operational conditions. The influence of polyelectrolyte, as a coagulant aid, in accompany with alum, ferric chloride and ferrous sulfate was also studied. A set of jar test experiments at 200 rpm of rapid mixing and 30 rpm of slow mixing and 30 min settling time was conducted to find the optimum chemical dose and pH. From the results of the tests, the optimum dose and pH for all coagulants and polyelectrolyte were obtained corresponding to the lowest concentrations of cyanobacterial toxins.

Keywords: Cyanobacteria, Microcystin, Coagulation, Alum,Ferric Chloride, Ferrous Sulfate

DISCUSSION AND EVALUATION ON THE ENVIRONMENTAL EFFECTS OF PERIODICALLY MEASURED HIGH-FREQUENCY ELECTROMAGNETIC FIELD AND CLIMATIC CHANGES IN 3 YEAR-PERIOD.

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Abstract:

In this study, the values of electric field intensity were continuously measured a metropolis in the city center in February for three years (2013-2015). These measurements with 0.5 second-periods are 100 KHz-8GHz frequency range. The measurements were done by the help of continuous electromagnetic field measurement station MonitEM. Continuous measurement results were gained with 24-hour periods. The minimum average and maximum values of electromagnetic field changes were observed and evaluated. It is observed the electromagnetic field having changes in different times in different a day changes depending on mobile communication traffic. However, the values have generally similarities on the same days of week. Also, the electromagnetic field changes in different times in a day have active values in different time periods. Hence, different strategies can be used in different times in a day to evaluate environmental factors of electromagnetic field changes. Moreover it is observed electromagnetic field actively changes depending on some environmental factors such as temperature, humidity and solar radiation. The potential temperature, humidity and solar radiation causing electric field intensity spread the environment were measured in the area of the measurements. Considering the all measurement results in the environment, the change of electric field intensity value comprehensively evaluated and presented.

Keywords: Electromagnetic Field, Monitoring Electromagnetic Field, Continuous Measurement, Climatic Change, Environmental Health

HOW TO BE MEDIATORSHIP THE CONCEPT CREATION OF THE LANDSCAPE PROJECT?

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Abstract:

When planning and designing, we always encounter the problem of defining the identity of the landscape. The perception of the project area is shaped by means of communication within the plan and design process. Therefore, the conception of the project tends inevitably towards uniformity, regardless of its actual geographical diversity. Specific landscapes emerge as representative of the whole, usually appearing as symbolic places that epitomize the project area. Such an image of space is realistic; it clears the vision and blinds us to quality life and environment. The choice of concepts for specific places as part of the general conception is based on the assignment of meaning. The choice of the project concept starts with personal opinions, but in the end it is rather the result of the application and budget. The key issue is the distinction between the objective, physical structures and the subjective image, that constitutes and sustains itself in the processes of social communication. The study was conducted in the Bartın City. The study area planned as a city park and recreation area and designs were made in different concepts. The research instrument was a set of landscape plan and design projects including survey, spot, master, vegetable, construction, sketch and perspective elements. After studies three concept prepared in different concepts are evaluated and explained. In conclusion, this paper outlined the area planned and designed different concept evaluated and seen different meaning reflects the project different fiction and line. So projects alongside the planners/designers' point of view develops with a focus on concepts. Finally, the results can be used to create another projects example and planners/designers can be advanced more in their profession.

Keywords: Project Process, Concept, Landscape Planning, Landscape Design.

PLANNERS / DESIGNERS' CHOICE AND REFLECTIONS ON PROJECT IN LANDSCAPE PLANNING AND DESIGN

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Abstract:

Recent years the relationship between the nature and human has become disappearing. Because people are forced to live in urban areas which are concrete and metal stack in todays. So city people have demanded to return the areas belonging to them from time to time where resembling the natural environment. In this regard urban parks are important for the city and the city people. This study focuses on the preferred qualities of area in terms of both environmental affordances and design characteristics. The study was conducted in the Bartın City. The study area planned and designed in different views of the planners/designers. After studies three projects prepared in different concepts were selected for example. The research instrument was a set of landscape plan and design projects including survey, spot, master, vegetable, construction, sketch and perspective elements. The study covers the importance of planners/designers' preference in landscape plan and design studios. The project phases involved setting thematic strategic objectives, conceptualizing spatial development scenario along with action plans and delivering model proposals. In compliance with protection and management of natural and cultural landscapes, the project introduces natural and cultural asset-based approach to form local sustainable development framework. Each development idea has been tested with others and the sustainability of natural-cultural landscapes, and subsequently spatial interaction analysis scrutinized. In conclusion, this paper outlined the area development strategy project alongside the author's point of view with a focus on concepts. Finally, the results were used to create a set of useful recommendations to help urban people and designers create more livable spaces in urban areas.

Keywords: Urban Open Areas, Urban Parks, Landscape Planning, Landscape Design, Recreation.

STRUCTURING AND HABITAT LOSS IN THE SOUTH EASTERN BLACK SEA COASTAL REGION

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Abstract:

The coastal zone of the Black Sea has great numbers of human activities and demand use of the coastal space . But coast has a special role in protecting the ecosystems. Human use has a profound influence on the environmental state of the coastal waters. The habitats of many plant and animal species in the coastal zone are more numerous than other places in the sea. Additionally, the coast is the area where people come into contact with the sea. Coastal habitat loss is great problem for ecosystem and social activities of the coastal city citizens . During the last decades, South Eastern Black Sea coastal side has a big road structuring. After road structure, region has lost its 60-80% natural coast. Trabzon Provience lost approximately 75% of 113km total coast. This loss is especially affected coastal habitat and ecosystem. In the region, poor planning has destroyed much of the aesthetic resources of the coastlines. For coastal rehabilitation and conservation of habitat in the region, decision-making process should focussed on coastal zone management.

Keywords: Southeastern Black Sea, Structuring, Coast, Habitat Loss, Coastal Zone Management

A COMPARISON OF EFFICIENCY METHODS FOR DETERMINATION OF TRITIUM CONCENTRATION IN BIOLOGICAL SAMPLES BY LIQUID SCINTILLATION COUNTER

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Abstract:

Liquid scintillation counting technique is mostly used for the detection and quantification of low energy β –emitters like H-3 and C-14. The liquid scintillation process is based on the conversion of the kinetic energy of nuclear emissions into emitted photons. Any factor which reduces the efficiency of the energy transfer or causes the absorption of photons, results in quenching of the sample. In this study, human urine was used as a biological sample. Urine samples were analysed and collected from 20 adult participants, of which 8 were female; their ages ranged from 23 to 50 years. About 50mL of a spot urine sample was collected in a 100 mL polyethylene bottle. Also, two standard samples with different levels of a certified liquid tritium source (Eckert & Ziegler Isotope Product) were prepared and measured. The tritium concentrations in urine and standard samples were calculated using two different efficiency methods. The results were compared to these efficiency methods. According to the comparison results, it found a difference about 0.8 % for urine samples, about 5.9 % for standard samples between the efficiency methods.

Keywords: Efficiency, Liquid Scintillation Counter, Tritium, Urine

RELATIONSHIP WITH ALTITUDE AND TRITIUM ACTIVITY LEVELS OF IKIZDERE RIVER WATERS IN RIZE, TURKEY

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Abstract:

Tritium is a radioactive isotope of hydrogen that emits low-energy beta particles, with a maximum energy of 18.6 keV, and with a half live of 12.3 years. It is found in nature and it can also be produced by human activities. Tritium behaves like stable, ordinary hydrogen and is usually found attached to molecules replacing hydrogen, having the chemical properties essentially the same as those of ordinary hydrogen. Therefore, monitoring of tritium activity concentrations in the environment is necessary in order to follow its circulation in the hydrosphere and biosphere. Liquid scintillation counting (LSC) is the best method for analyzing natural water samples because in this method the water sample is directly combined with an appropriate aqueous scintillation cocktail, it required pretreatment is minimal and the counting efficiency is high. In this study, a total of 32 water samples were collected from İkizdere river (78.4 km). Also, the altitude of the sampling point was determined by the Magellan GPS device. SPSS software (version 21) was used to for statistical analysis. Water samples were distilled before they were measured by LSC to remove any impurities, to reduce quenching and to prevent the introduction of other radionuclides which might adulterate the results. The average tritium concentration for İkizdere river water samples was found as 1.72 ± 0.94 Bq/L and maximum tritium concentration was 2.32 Bq/L. The minimum detectable activity (MDA) for this method was 1.36 Bq/L. The tritium concentrations of 17 water samples (53 %) were below of the MDA. This study confirmed that river water samples analysed have a low tritium content and these results are much lower than permissible tritium dose limits determined by TSE, WHO and USEPA. Statistically, a relationship ($p>0.05$) between altitudes and tritium concentrations was not observed.

Keywords: Altitude, Liquid Scintillation Counter, River Water, Tritium

BACTERIAL INACTIVATION WITH ULTRASOUND IN WATER

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Abstract:

Microbial contamination in water have to be controled via several inactivation processes according to water and health regulations. In order to improve microbial inactivation efficiency of these processes, new approaches have been carried with combining advanced technology such as ultrasound. Its system parameter should be investigated to use ultrasound aiming bacterial inactivation in water. Staphylococcus aureus which is Gram possitive bacterium is one of the hospital infections agent. In this study inactivation of Staphylococcus aureus bacterium was researched with ultrasound in water. The several system parameters of ultrasound were invastigated such as frequency and media ions. The effects of three diffrent ultrasonic frequencies was determined to inactivation of Staphylococcus aureus in batch type reactor. The several media ions effects on ultrasonic bacterial inactivation were identicated for their water soluble compounds. This study which in several ultrasonic system parameters were optimized shows that inactivation of Staphylococcus aureus was successfully accomplished with ultrasound in water.

Keywords: Staphylococcus Aureus, Bacterial Inactivation, Ultrasound, System Parameters

THE DIVERSITY OF USING GLYCEROL AS A BY-PRODUCT OF BIODIESEL PRODUCTION

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Abstract:

Using biodiesel as an alternative fuel or additive for diesel engine fuel has become a necessity due to the toxic pollutants and green effects of petroleum based fuel (D2) emissions. The main obstacle in the commercialization of biodiesel is its high cost of producing. Utilization of by-products of biodiesel production processes plays a role of contributing to the sustainable consolidation of the biodiesel markets and decreasing biodiesel fuel prices. The predominant biodiesel production process involves a phase of transesterification that yields glycerol as a by-product. Using refined glycerol is limited because of its high cost refining costs. International crude glycerol market is still at an early stage, however, in literature, various researches have indicated the possible uses for using unrefined glycerol and they reported that using crude glycerol could lead to reducing in total production costs of biodiesel fuel perceptibly. In this work, the diversity of using unrefined glycerol is represented as an overview.

Keywords: Glycerin, Transesterification, Biodiesel

DECOLORIZATION OF REACTIVE RED 120 AND INFASET BLACK DYES BY FENNELIA NIVEA BIOMASS

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Abstract:

Objectives: Textile industry is one of the most important sources of pollutants in liquid form. Approximately 70% of all the dyes used in textile industry. Discharge of untreated textile industry effluents may cause many adverse effects for aquatic and terrestrial organisms. Biosorption is regarded as a promising future approach due to its low cost, practical implementation and high efficiency. The aim of this study is to decolorize Reactive Red 120 and Infaset Black using Fennelia nivea pellets.

Research methods: Fennelia nivea was isolated from İzmit (Turkey). Reactive Red 120, Infaset Black were obtained from Piko Kimya Textile and Trade Limited Company. The culture medium which was used for decolorization experiments composed of (per liter): 5g glucose, 1g (NH4)2SO4, 1g KH2PO4, 0.5g MgSO4.7H2O, 0.1g yeast extract, 0.1g CaCl2.2H2O.In decolorization experiments live and heat killed F. nivea cells (5g wet weight) were used. At the end of the incubation period, culture liquid was separated from biomass through filtration (Whatmann No.1). The decolorization of Reactive Red 120(515nm) and Infaset Black(569 nm) were determined spectrophotometrically with Shimadzu UV-1700 (Japan) spectrophotometer. The percentage of decolorization was calculated following equation. Decolorization (%) = [(ODi – ODf) / ODi] ×100] Laccase activity was determined spectrophotometrically by oxidation of ABTS.

Results and Conclusions: The present work demonstrates that F.nivea biomass has good dye adsorption potential and could decolorize Reactive Red 120 and Infaset Black through biosorption rather than enzymatic biodegradation. Laccase activity was not determined in culture mediums. Our results showed that heat killed(91%) cells more effective than live cells(74%) at decolorization of Reactive Red 120. Whereas, we could not observe differences between heat killed(96%) and live cells(96%) at decolorization of Infaset Black

Keywords: Decolorization,Reactive Red 120, Infaset Black, Fennelia Nivea

DETERMINATION OF CLARITHROMYCIN ANTIBIOTIC CONCENTRATION IN WASTEWATER

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Abstract:

Antibiotics are defined as all kinds of pharmacological agents which can be produced by any microorganism or artificially to kill or stop proliferation of another microorganism. The main sources of antibiotics are; homes, hospitals, nursing homes (medical treatment, direct disposal of unused products), livestock and poultry breeding (growth stimulation purposeful drugs) and pharmacological agent producers (Kulis vd., 2003). Disposal rates of antibiotics without being metabolized ranges between 10% to 90%. Therefore, human and animal feces can contain large amounts of antibiotics. 30% of the all antibiotics used are metabolized in the body on average. 70% of all antibiotics used is mixed sewage through feces or urine unchanged (Kümerer, 2009). Thus, waste water treatment plants are becoming a serious business releasing antibiotic to the environment. It leads to antibiotic contamination in the environment as conventional methods applied in the treatment of waste resulting from the manufacturing process for human and animal antibiotics, waste resulting from livestock raising and household wastewater are inadequate (Heberer, 2002).

It is stated in the studies conducted abroad that, currently used conventional treatment plants for the treatment of antibiotics are inadequate. It is known that antibiotics adversely affect the ecosystem as they can reach to the receiving environment and food chain due to the fact that they are biodegradation resistant compounds.

Disposal of clarithromycin; which is a macrolide and has a higher amount of use in our county; in waste water treatment plant inlet, biological treatment output and advanced biological treatment output were examined and evaluated in this study.

Keywords: Antibiotics, Clarithromycin, Wastewater, Biological Treatment

THE ADSORPTIVE REMOVAL OF NATURAL ORGANIC MATTER FROM WATERS USING VARIOUS ORIGINAL/MODIFIED NATURAL PARTICLES AND WASTE MATERIALS

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Abstract:

Natural organic matter (NOM) which presents in all natural water is a heterogeneous mixture of organic substances formed by biotic and abiotic reactions. NOM causes to such various problems as disinfection by products (DBPs) formation, biological re-growth in distribution systems, aesthetic problems associated with taste and odour. In terms of health, the most alarming problem is DBPs which is resulted from reactions seen between NOM and disinfectants.

In this study, the adsorptive removal of natural organic matter from synthetic humic acid solutions is aimed by using original and modified natural or waste materials. For that purpose, red mud particles were acid activated by acidification and heat treatment and the pumice particles were coated with iron oxide. Acid activation/heat treatment of original red mud (ORM) particles significantly decreased their average pore width and increased their surface area. Iron oxide coating of pumice particles and acid activation/heat treatment of ORM decreased their pHpzc values and increased surface acidity. In addition, iron oxide coating pumice particles significantly increased their iron content.

The results of the kinetic studies indicated that NOM adsorption by iron coated pumice and original red mud particles reached equilibrium at 24 h. Iron oxide coating of pumice particles significantly enhanced their NOM uptakes. Maximum UV280 absorbance removal which was obtained by iron coated pumice particles was 58 % while maximum UV280 absorbance removal which was obtained by original pumice particles was 40 %. 45 % UV280 absorbance was obtained by original red mud particles at 1 g/L dosage and above this dosage, no significant change was observed. Maximum UV280 absorbance removal which was obtained by acid activated red mud particles was 70%. The adsorption isotherm data was generally well fitted to modified form of the Freundlich isotherm (adsorbent dose normalized).

Keywords: Coating, Iron Oxide, Pumice, Red Mud, Natural Organic Matter, Adsorption

RESEARCHING ON THE INFLUENCE OF ENVIRONMENTAL PARAMETERS ON AMMUNITION LARGE CALIBER PERFORMANCE DURING STORAGE

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Abstract:

Influence of environment on ammunition performance and weapon are the subject of continuous research in order to be able to estimate lifetime of ammunition and establishing quality control. There are continuous research about causes of failure and cancellation mechanism on ammunition parts like warhead, cartridge with propellant, primer, fuzes and pyrotechnics components.

Temperature and humidity of environment are the main parameters that influence on ammunition performance during storage. Available data about influence of environmental parameters during ammunition storage and detection of factors that influence on ammunition lifetime are relatively deficient.

Measurements of temperature and relatively humidity were performed on three geographical locations with different atmospheric parameters, on certain number of objects for ammunition storage during all four seasons. Measurements of temperature and humidity were performed outside and inside of the ammunition warehouse. At the same time, temperature and humidity changes were measured inside of the wooden case and tight fiber of the container with ammunition. Measurements results are very interesting and require continuation of measurement for a longer period. There is necessity of making model for heat and mass transfer in a complex package of ammunition, which is consisted of inner and outer packaging.

Keywords: Environment, Ammunition, Storage, Lifetime, Temperature, Humidity, Wooden Case, Fiber Of The Container

MONOAROMATIC BTEX HYDROCARBONS IN THE COASTAL LAKE SEDIMENTS OF THE GULF OF SAROS (NE AEGEAN SEA)

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Abstract:

This study reports the first data on the concentrations and distribution of monoaromatic BTEX hydrocarbons – benzene, toluene, ethylbenzene and xylene compounds in the lagoon sediments surrounding the Gulf of Saros in the northeastern Aegean Sea. Sediment samples were collected from nine locations, namely Enez lakes (Enez, Işık, Kuvalak, Dalyan, Karagöl), Vakıf, Mecidiye-Erikli, Uzungöl and Gelibolu saltpan, in October 2005.

Results indicated that total concentrations of BTEX compounds in sediment ranged from 373.3 µg/kg to 5.0 µg/kg, with a mean value of 65.6 µg/kg. The contributions of individual BTEX to the total BTEX concentration are in the following order: (m, p)-xylene (40.9 µg/kg)>toluene (28.3 µg/kg)> o-xylene (13.4 µg/kg)> ethylbenzene (5.8 µg/kg)> benzene (2.2 µg/kg). It is show clearly that (m, p)-xylene was the most abundant compound in sediments, and the average contribution to the total BTEX was 48%. It is followed by toluene, with an average contribution of 43%.

Under the effects of anthropogenic inputs from industrial point sources or diffuse emissions, over a long period of time, the environmental problems of lagoons are exacerbated every day. Our results indicate that the environmental quality of the lagoons along the Gulf of Saros has been affected over time by anthropogenic pollution and need urgent and particular actions. These lagoons are important places in daily life, providing contributions to regional and national economy in terms of conservation biological diversity, particularly fisheries, livestock, salt production, reed cutting and recreational activities. Considering that the environmental stress in the lagoons mainly related with the fertilizers and pesticides used for agricultural facilities and mosquito fighting, these chemicals must be prevented from being released to the environment. Even volatile compounds in surface waters tend to evaporate into the atmosphere, the elevated concentrations of BTEX compounds observed in the sediment samples may be persistent.The sediment samples presented here is recovered within the framework of the 179 IU BAP Project.

Keywords: Monoaromatic Hydrocarbons, Sediment, Gulf Of Saros

THE ENVIRONMENTAL AND CLIMATIC FUNCTIONS OF GREEN ROOFS

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Abstract:

The dramatically increase in human populations and the migrations into the city centers cause the problem of unplanned urbanization. This problem specifically induces the destruction of green-fields and parks in metropolises. Thus the people living in these cities are indirectly forced to live in a depressed psychological mood between huge concrete-made buildings, without any involvement in natural life. Furthermore the unplanned urbanization causes a decrease in the sources above ground since it has environmental and climatic damages on Earth. The expensiveness of energy sources, difficulties on finding healthy food sources and decrease in productivity conveyed us to search on the solution of this unplanned urbanization problem. In this case, the green roofs which are also called living roofs, enables the users to plant on the roofs and intersect the metropolis with the natural life. Moreover the surfaces and roofs of buildings that are covered with plants may provide healthier city climates.

The aim behind planting on surfaces of the buildings is not only providing a visual sense of nature. There are lots of benefits of this application like: decreasing temperature differences between summer-winter and day-night, preventing the flood caused by sudden water flows after soakers, filtering the air from the toxic gases and dusts of cities, absorbing the noises around, providing a habitat for flora and fauna living around, covering the buildings with a natural beauty of plants, increasing the green field amount per person, combining the different and separated elements of Earth together...

In this research, beside the decorative effect; the environmental and climatic functions, the importance and necessity of green roofs will be examined by using the methods of literature review and the investigation of Turkish and international examples of this usage.

Keywords: City, Climate, Ecology, Environment, Green Roof

INVESTIGATING THE RADIATION ABSORPTION AND THERMAL PROPERTIES OF COMPOSITE MATERIALS INCORPORATING WASTE EGGSHELL, WASTE SAWDUST AND PUMICE

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Abstract:

Radiation is widely used in the field of medicine, energy, and military. The most effective way for protection from the negative effects of radiation is shielding the places. Concrete is the most common shielding material for buildings. It is well known that the major component of concrete is cement and cement plants have some harmful environmental impacts at all stages of the production process. In this study, composite materials produced incorporating waste eggshell, waste sawdust and pumice at different amounts with epoxy as binder material as an alternative to other shielding materials which are produced by using cement. Shielding properties of composites at 17, 26 and 59.6 keV were investigated. Unit weight, thermal conductivity coefficient, ultrasonic sound velocity and linear radiation absorption coefficient values of the composite materials were obtained and compared with the classic mortar samples. As a result, it is presented that linear radiation absorption coefficient was increased with the increase of waste eggshell amount. Besides, increasing amount of sawdust affected the thermal and acoustic properties positively.

Keywords: Radiation Shielding, Thermal Conduction, Eggshell, Sawdust, Pumice

PREDICTING IMPACTS OF CLIMATE CHANGE ON GEOGRAPHIC DISTRIBUTION OF ORIENTAL SPRUCE (PICEA ORIENTALIS) USING MAXENT MODELLING

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Abstract:

Ecological niche modelling (ENM) has become an important part of conservation planning in recent years. Detecting how species which has economic importance affected by climate change plays an important role in order to plan sustainable use of the species. Current and future potential distributions of species according to different climate change scenarios can be predicted with ENM by combining known GPS records with digital layers of environmental variables. Aim of the present study is to predict impacts of climate change on geographic distribution of Oriental Spruce (Picea orientalis (L.) Link) is endemic to the Caucasus Biodiversity Hotspot which is very important in terms of economy. Occurrence records of the species were obtained from literature and gbif (Global Biodiversity Information Facility) database, and environmental variables obtained from climond website. Current potential distributions of the species were predicted using all these data with Maximum Entropy algorithm by MaxEnt software. Additionally, possible distributions of the species in 2050 were modelled according to a balanced (Miroc-H A1B) and a pessimist (Miroc-H A2) scenario. Thus, effects of climate change on the species distribution have been observed.

Keywords: Climate Change, Maxent, Picea Orientalis

OPTIMIZATION OF PARAMETERS FOR THE PREPARATION OF IRON DOPED ACTIVATED CARBONS BY USING TAGUCHI METHODOLOGY

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Abstract:

Activated carbon (AC) adsorption is an effective method for removal of many micropollutants in water and wastewater treatment. Various studies have been made to improve the performance of ACs for specific contaminants removal. Iron incorporation into the AC-surface – iron doped ACs – is an effective method to increase the adsorption potential. At the end of the treatment, separation of the ACs from water is a problem due to time. Iron-doped activated carbons can be separated in a short time by applying magnetic field. In this study, iron-doped ACs nanoparticles were synthesized via co-precipitation method. The Taguchi L9 (34) experimental design was used to prepare the iron-doped ACs for the removal of micropollutants from water. The following parameters were selected for optimization of the experimental conditions: the source of AC (wood, coconut and coal based), temperature (75, 85, 100° C), time (4, 8, 12 hours), and C:Fe ratio (1:1, 2:1, 3:1). Iron-doped ACs obtained using the optimum conditions predicted by the Taguchi methodology were characterized using FT-IR spectroscopy, and SEM/EDX analysis.

Acknowledgements:

The work was supported by the Research Fund of the Istanbul University(Project number: 53027)

Keywords: Micropllutants,Iron Doped Ac,Taguchi Metodology

ENVIRONMENTAL FACTORS IN THE DEVELOPMENT OF NEUROLOGICAL DISEASES

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Abstract:

It is now thought that the etiology is multifactorial neurological disease, and disease that most likely is produced by the interaction of genetic and environmental factors. Accurate, consistent and irrefutable conclusions about the influence of certain environmental factors can not yet be defined, as are studies in various parts of the world by different research methods, diagnostic criteria, classifications, medical and laboratory findings, and the selection of controls. Multiple sclerosis is five times more common in the climatic conditions prevailing in the northern parts of the United States, Canada and Europe than in tropical regions and in the Far East. Air, sun and taking vitamin D, according to many studies as possible reasons for the differences in the frequency of MS in relation to the earth's surface. However, there are some important differences between north and south, as well as changes in prevalence rates over time. New studie show that the consumption of cow's milk strongly associated with MS - player. From this we can draw the conclusion that this disease is strongly associated with environmental factors than to genes.

The aim of the research was to determine the influence of environmental factors for the development of multiple sclerosis. Methods: A qualitative non-experimental research., scientific literature review. Searched various biomedical data bases (MEDLINE, EMBASE, Cochrane, PubMed, Google Scholar).

Results: Immunological, epidemiological and genetic evidence supports the view that the exposure of persons genetically predetermined factor or environmental factors during childhood (perhaps some of the more common viruses), are eventually leading to inflammatory demyelination of immune.

Conclusions: Various theories attempt to explain the cause of multiple sclerosis combination of known data about the symptoms of the disease, and numerous studies. According to current knowledge that it occurs is most likely the result of interactions (the combination) of ecological environmental factors and genetic determination.

Keywords: Environmental Factors, Neurological Diseases, Multiple Sclerosis

COMPARISON OF GROWTH PERFORMANCE OF RAINBOW TROUT (ONCORHYNCHUS MYKISS) AND TURBOT (PSETTA MAXIMA) IN POLYCULTURE

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Abstract:

The objectives of the present study are to compare growth performance and feed conversion ratios of rainbow trout and Black Sea turbot in monoculture and duo-culture tank reared conditions in the Black Sea Region, Turkey.The growth trial, which lasted 56 days, was carried out at the Prof.Dr. İbrahim OKUMUŞ Aquaculture Research and Production Unit at Karadeniz Technical University. The fish were about 14-month-old hatchery reared rainbow trout and 9-month-old hatchery reared Black Sea turbot. Fish were kept in 0.2 m3 fibreglass tanks, and brackish water (17‰) supplied. Each tank contained 20 fish from each species for monoculture, and 10+10 fish from each species for duo-culture. Fish were fed to apparent satiation with commercial dry extruded pellets of 4 mm containing 50% crude protein and 18.0% crude lipid At the end of the study, mean live weights of rainbow trout and Black Sea turbot increased to 282,15±9,98 g and 69,07±1,17 g in monoculture 256,77±9,71g and 67,53±6,71 g in duo-culture, respectively (Fig 1). According to final mean weights it might be concluded that, mixed rainbow trout group has shown significantly better growth performance than the others. Mean daily feed consumption, feed conversion ratios and condition factors were not significant among the groups. But feed conversion ratio in polyculture group was found slightly lower than others. As a result, there was no difference on growth performance of separately stocked rainbow trout and turbot. But when the varieties have been stocked mixed, rainbow trout ones grows better than the turbot due to the variety's dominance.

Keywords: Rainbow Trout, Turbot, Polyculture, Growth

EFFECT OF TEMPERATURE ON GASTRIC EMPTYING IN SALVELINUS FONTINALIS FED ON COMMERCIAL DIET

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Abstract:

In this study, the gastric emptying of brook trout (Salvelinus fontinalis) fed on commercial granule feed at 12, 15, and 20 °C was determined. The experiments have been carried out in three tanks of 50 L. A number of 300 fish (av. length 19.30±1.03 cm and 81.6±17.41 g in weight) were acclimated to the experimental condition prior to use. The fish was fed on commercial extrude feed of 3 mm to the satiation level which lasted for 15 min in avarege. When the feeding was ceased, the food left uneaten in the tank was siphoned. Soon after the feeding stoped 3 fish were randomly sampled for determining the average food eaten. The stomach content has been provided from the heavily anaesthetised and later by means of serial slaughter. Then it was continued at every 3 hours until the first empty stomach of fish was observed. The satiation amount was estimated to be about 1.90% bw at 12 °C, 2.05% bw at 15 °C, and 1.24% bw at 20 °C. The first empty stomach was noticed as 48 h after the first feeding for 12 and 15 °C groups, and 33 h for the 20 °C group respectively. The emptying was best described by exponential function. It was found that the temperature has affected the gastric emptying rate and time in brook trout at the stated conditions significantly ($p<0.01$). This piece of information is valuable especially during feeding, transport and disinfection of the fish for the different reasons.

This study was carried out by TUBİTAK 1001 project grant no:113O362

Keywords: Brook Trout, Salvelinus Fontinalis, Feeding, Gastric Empting, Temperature

ADSORPTION AND KINETIC STUDIES OF ORGANIC COMPOUNDS BY GRAPHENE NANOSHEETS, CARBON NANOTUBES AND GRANULAR ACTIVATED CARBONS

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Abstract:

Carbon nanomaterials bring new prospects for the removal of organic compounds (OCs) due to their unique properties. Graphene nanosheets (GNSs) are two-dimensional sheet of sp2-hybridized carbon. Its extended honeycomb network is the basic building block of other important allotropes; it can be stacked to form 3D graphite, rolled to form 1D carbon nanotubes (CNTs), and wrapped to form 0D fullerenes. In the first section of this study, adsorption of two organic compounds (OCs), phenanthrene (PNT) and trichloroethylene (TCE), by graphene nanosheet (GNS), graphene oxide nanosheet (GO), single–walled carbon nanotube (SWNT), multi–walled carbon nanotube (MWNT), and two coal based granular activated carbons (GACs- HD3000 and F400) in distilled-deionized water (DDW) were investigated. In this study, constant dose batch adsorption isotherms for PNT and TCE organic compounds were conducted by using 1 mg/255 ml and 5mg/125 ml, respectively. The results of experiments were modelled according to commonly used isotherm models as Freundlich (FM), Langmuir (LM), Langmuir-Freundlich (LFM) and Polanyi-Manes Model (PMM). All isotherm results, PNT uptake was higher than TCE for all adsorbents. This was attributed to their molecular properties such as solubility and hydrophobicity of OCs. Besides, the order of PNT and TCE single point adsorption coefficients represented by Kd at 500 µg/L was GNS > HD3000 > GO > SWNT > MWNT > F400 and HD300 > F400 > SWNT > GNS > GO > MWCNT, respectively. However, at lower equilibrium concentrations (e.g., Kd,10) the order of PNT and TCE uptake capacities changed to GNS > HD3000 > GO > SWCNT ~ MWCNT > F400 and HD3000 ~ SWCNT > F400 > GNS > GO > MWCNT, respectively. All isotherm results showed that the adsorption capacity of adsorbents were altered depending on the types of absorbate and adsorbent. Also, the results of isotherm models were mainly fitted well with modified Freundlich and Langmuir-Freundlich isotherm models. In the last section of this study, adsorption kinetics of PNT and TCE by GNS, GO, SWCNT, MWCNT, and GACs were examined in DDW. The results of kinetics experiments were evaluated depending on commonly used kinetic models. Among the all studied kinetics models, pseudo second order model Type–1 (r2: 0.978–1) provided good fitting for the kinetic data. This result showed that there might be a chemical interaction between OCs and adsorbents.

Keywords: Adsorption, Kinetics, Graphene Nanosheets, Carbon Nanotubes, Granular Activated Carbon, Organic Compounds

DECREASING OF TRIFLURALIN HERBICIDE IN SOIL WITH ISOLATED BACTERIA AND FUNGI

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Abstract:

After application of herbicides, agricultural soils exposed to some micropollutants. If there is no precautions, residuals of these micropollutants incur bioaccumulation and directly reaches to humans with food chain and there will be some health problems.

In this study, firstly, sterilized agricultural field soils were filled into an artifical field mechanism in 1 L volume of sterile plastic bottles. Secondly, “Penicillium talaromyces, Penicillium simplicissimum, Penicillium thrichoderm, Metacardceps chlamydaspary, Stachybotrys chartarum and Alternia alternata” isolated as fungi and, “Bacillus simplex, Bacillus muralis, Micrococcus luteus, Micrococcus yunnannesis, Bacillus meganterium” isolated as bacteria and enriched in incubator at 200C. After that, Trifluralin herbicide added into these soil at field application concantrations (96ml of active ingredient/1000m2).

Mixture of isolated bacteria and fungi cultures was added to these artifical field mechanism in different concantrations (1, 2, 5 and 10 ml) and sterile tap water was added to these mechanism for gaining filtrate water. Parameters of Biochemical oxygen demand (BOD), dissolved oxygen (D.O) and pH were analysed on this filtrate weekly.

Best removal rate for BOD was found as 78% with 10 ml of mixtures at the end of 4. week (from 1320mg/l to 300 mg/l). Filtrate of soil generally showed acidic characteristics in study weeks. The reason was likely reaction of released CO2 from bacteria and fungi activities. Carbonic acid production decreased pH of the filtrate.

Keywords: Herbicide, Trifluralin, Biochemical Oxygen Demand, Dissolved Oxygen

DECOLORIZATION OF BASIC DYE MAXILON RED GRL SOLUTION BY FENTON PROCESS

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Abstract:

Dyes are substances that possess high coloration degree and widely used in textile, cosmetics, food, paper, leather, printing and pharmaceutical industries. It was reported that approximately 10-15% of this production has been released into the environment causing aesthetic problem and different toxic problems in receiving bodies. Different treatment methods including physical, chemical and biological processes have been employed to treat dye wastewater, however, with a rather limited success. Recently, advanced oxidation processes (AOPs) have been used to treat wastewater containing toxic and refractory pollutants. Among the AOPs, Fenton oxidation process has been considered to be a promising and attractive treatment method for the effective decolorization and degradation of dyes. Fenton process is capable of producing hydroxyl radicals and efficient, low cost, easy to operate for dye removal .

The purpose of this study was to investigate the decolorization of the basic dye maxilon red dye in aqueous solution using Fenton process. The effects of experimental parameters, such as initial concentrations of Fe+2, of H2O2 and of maxilon red dye, pH, reaction time and temperature were examined. The optimum conditions had been determined and it was found that efficiency of decolorization obtained after 20 min of reaction, was about 99.4%. The optimal parameters were: initial pH=3; [H2O2]0=200 mg/L; [Fe+2]0=150 mg/L; for a concentration of dye [MR]0=100 mg/L; reaction time=20 min; temperature=30 oC.

Acknowledgment: The authors thank the Scientific and Technological Research Council of Turkey (TÜBİTAK), for their financial support [TÜBİTAK 2209-A Project, Project number:1919B011402641].

Keywords: Advanced Oxidation Process, Decolorization, Fenton Process, Maxilon Red Grl

TREATMENT WITH VARIOUS CONSTRUCTION MATERIALS OF BORON WASTE IN DIFFERENT PROPORTIONS

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Abstract:

Measurements have been made to identify modification of the γ-ray transmission factors of various construction materials according to percentage increasing concentration of boron waste by using a narrow-beam-geometry at 59.5 keV. Photons passed through different samples were detected with a very sensitive Si(Li) detector. We have made to investigate experimental results and these results discussed İn this paper.

Keywords: Boron Waste, Construction Materials, Transmission Factors

COMPARISION OF CLASSICAL AND VEGETABLE OILS (COTTON OIL) FOR CONCENTRATION OF ZONGULDAK HARDCOAL BY FLOTATION

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Abstract:

In this study, the use of vegetable oils as an alternative to classical oils for flotation on Zonguldak Hardcoal has been investigated. Kerosene was used as classical oil and cotton oil was used as vegetable oil. The effects of collector concentration, pH, flotation time, pulp density, impeller speed, frother concentration on combustible recovery, ash reduction and efficency index were studied and optimum conditions were determined.

As a result; it was determined that kerosene and vegetable oil(cotton oil)had similar performances on Zonguldak hardcoal flotation.

Keywords: Flotation, Hardcoal, Kerosene, Cotton Oil, Combustible Recovery, Ash Reduction, Efficiency Index.

AN EXAMPLE OF FINDING BOTH ECONOMICAL AND ENVIRONMENTAL FRİENDLY ENERGY SOURCE

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Abstract:

Energy efficiency in a short definition is minimizing the energy used without reducing efficiency and amount in generation. To think energy efficiency only in economical dimension would be wrong while environmental pollution gives big alarms in recent years. Because reduction of energy used means to be one step closer to a clean environment.

In this study firstly nine different energy sources are analyzed as economical to supply energy requirement for 1000 houses town for 30 years. Than the economical five sources (Solar, Coal, Hydroelectric, Wind and Naturalgas) are analyzed as enviromental. In this way the best solution is found both economical and enviromental for supplying energy requirement.

Keywords: Energy Efficiency, Enviroment, Energy

INVESTIGATION OF GOLDEN HORNE DEEP SLUDGE BY BIOCHEMICAL OXYGEN DEMAND AND MICROBIOLOGICALLY

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Abstract:

In this study, Biochemical Oxygen Demand (BOI5),Total Coliform ve Escheria coli analyses were studied on deep sludge samples taken from 4 stations named Golden Horn Bridge, Between Eyup-Sutluce, Between İslands and After Islands in Golden Horn, one of the inner port of Istanbul between December 2012 and April 2013. According to the evaluation, the highest amount for BOI5 was found as 2500 mg/kg on 2. Station in April. The highest amount for Total Coliform bacteria number was on 4. Station as 9 x 10 5 unit/kg on April. In parallel with the same sample,E.coli number was found as 3,5 x 10 5 unit/kg. Sludge samples analyses and their results were compared with old studies about them and some evaluations were done.

Keywords: Golden Horn, Deep Sludge, Total Coliform, Boi5

USE OF BIO – ECOLOGICAL RISK INDICES TO EVALUATE THE SURFACE SEDIMENT QUALITY: A CASE STUDY OF SEYDISUYU STREAM BASIN (ESKIŞEHIR)

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Abstract:

Many indices have been developed to evaluate the environmental risks of toxic elements in surface sediments. Potential Ecological Risk Index (RI) and Biological Risk Index based sediment quality guidelines (mERM-Q) are two of the most widely used sediment indices used to evaluate the environmental risks. Seydisuyu Stream that is one of the most important branches of Sakarya River is located on the Eskişehir Province and exposed to an intensive agricultural, domestic and industrial pollution. The aim of the present study is to evaluate the sediment quality of Seydisuyu Stream Basin by using Potential Ecological Risk Index (RI) and Biological Risk Index (mERM-Q). For this purpose, sediment samples were collected in summer season of 2012 from 15 stations selected on Seydisuyu Stream Basin (3 of them from the Çatören Dam Lake and 2 of them from the Kunduzlar Dam Lake) and some toxic element accumulations (As, Cr, Cu, Pb, Zn, Cd and Ni) in sediment samples were investigated. Than the Potential Ecological Risk Index (PERI) and Biological Risk Index (BRI) applied to the results to assess the environmental risks of heavy metals in the region. According to the results of PERI, chromium and cadmium; and according to the results of BRI, chromium and nickel are the most risky elements for the Seydisuyu Stream Basin.

Keywords: Potential Ecological Risk Index, Biological Risk Index, Seydisuyu Stream Basin

PRE-TREATMENT OF METAL INDUSTRY WASTEWATERS BY USING DESTABILIZATION AND MEMBRANE PROCESS

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Abstract:

The pre-treatment of the metal industry wastewaters by using microfiltration alternative to that the destabilization (chemical process) was investigated in the present study. The wastewater samples were provided by Metal Working Fabricate in Sivas Industrial Area, Turkey. First part of this study is coagulation/flocculation and iron salt and other coagulant and polyelectrolyte were used as a coagulant. The effects of coagulant dosage, pH and settling time on COD, turbidity, suspended solids, oil and TOC removal were investigated. The optimum operation conditions were found to be 0.5g/L iron salt, pH 8 and 20 minutes of settling time. The COD, turbidity, SS, oil and TOC removal efficiencies were found to be 20.5%, 65.2%, 64.3%, 91.6%, 97.95%, respectively.

Microfiltration membrane was used to pre-treatment of wastewater as an alternative to coagulation/flocculation. Two membrane filters (Trisep PVDF (0,2um) and GE Osmonics PVDF (0,3um)) were used for this purpose. Trisep PVDF membrane removal efficiency was better than other used membrane and COD, turbidity, SS, oil and TOC removal efficiencies were determined as 55.3%, 99.4%, 92.1%, 99.6%, and 18.6%, respectively.

Microfiltration membranes have shown a better performance for pre-treatment of metal working industry wastewaters. After microfiltration, series of other membrane filtration studies were archived in order to provide effluent discharge for reuse of water.

Keywords: Microfiltration, Coagulation, Flocculation, Metal Industry, Wastewater, Membrane

PRESENT STATUS OF THE PROTECTED AREAS IN TURKEY AND THEIR PROBLEMS

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Abstract:

The history of nature protection in the world dates back to very old times. The first known protection is the Indian Emperor Asoka's enactment in 252 BC. The first protection status was granted to Yellowstone in the USA in 1872 by declaring it to be national park. In Turkey, the first protection attempt was the declaration of Yozgat Pinetum to be national park in 1958. Afterwards, several points in Turkey were taken under protection in different statues. Today, protected areas in Turkey are classified by Turkish Ministry of Forestry and Water Affairs into protection categories such as conservation forests, urban forests, honey forest, gene conservation forests, seed stands, seed gardens, wildlife protection and development areas and wetlands. In addition, other protected area types by another ministry, Turkish Ministry of Environment and Urbanisation, are specially protected environmental areas and protected areas. In the present study, updated information is given about the areas under official protection status in Turkey, including their types, number and surface areas. In addition, the ratio of protected areas to country territory is calculated based on the given figures and the ratios are compared to those determined by IUCN, which is the 4% at least of a country's territory. General problems faced by protected areas in Turkey are evaluated at the last stage of the study.

Keywords: Key Words: Protected Areas, Present Status, Problems, Iucn, Turkey

CURRENT STATUS AND PROBLEMS OF THE PROTECTED AREAS IN TURKEY

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Abstract:

The history of nature protection in the world dates back to very old times. The first known protection is the Indian Emperor Asoka's enactment in 252 B.C. The first protection status was granted to Yellowstone in the USA in 1872 by declaring it to be national park. In Turkey, the first protection attempt was the declaration of Yozgat Pinetum to be national park in 1958. Afterwards, several points in Turkey were taken under protection in different statues. Today, protected areas in Turkey are classified by Turkish Ministry of Forestry and Water Affairs into protection categories such as conservation forests, urban forests, honey forest, gene conservation forests, seed stands, seed gardens, wildlife protection and development areas and wetlands. In addition, the areas protected by the Ministry of Environment and Urbanization are the special environmental protection areas and other protected areas. It has been determined in the study that there are 3495 areas which are protected with legal status in Turkey, and the total size of these areas has reached 7.516.180,86 ha. The protected areas cover the 9,23 % of the country's total area. This figure shows that the status in Turkey has reached a perfect level according to the criteria set by the IUCN telling that at least 4% of a country's total area must be under protection. However, it has been determined in this study that although the size of the protected areas is not problematic, these areas have administrative, legal, economic, etc. problems.

Keywords: Protected Areas, Present Status, Problems, Iucn, Turkey

EFFECT OF POTASSIUM APPLICATION ON NUTRIENT UPTAKE OF VARIETIES OF CHICKPEA (CICER ARIETINUM L.) INOCULATED WITH RHIZOBIUM

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Abstract:

This study was conducted as a 2-year field study in Van Conditions. The study were used in Aziziye-94, Gökce, Yaşa-05 and Işık-05 of chickpea cultivars with the control and 5 kg / ha K2O as K2SO4 fertilizer. Chickpea cultivars inoculated with Rhizobium Ciceri. Trial was established as a randomized complete block design with 3 replications. At the end of the study showed that significant differences in nutrient content of varieties. Varieties nutrient intake were observed values for each of the phosphorus straw two years, only grain second year in potassium, calcium straw every two years, grain first year, second year in magnesium straw, iron straw and grain every two years, your squad straw and grain the first year, grain zinc significant changes in the first year, every two years, and that copper straw. Potassium application was determined significantly changes of phosphorus content every two years straw, straw calcium every two years, grain the first year, every two years, magnesium straw, seed the second year, the second year in grain of iron and manganese in the second year grain.

Keywords: Potassium, Chickpea, Nutrient, Macro Element, Micro Element, Rhizobium

SEMI-ANALYTIC SOLUTION FOR THE MHD TWO DIMENSIONAL STAGNATION-POINT FLOW OF A NEWTONIAN FLUID TOWARDS A UNIFORMLY HEATED AND MOVING VERTICAL PLATE

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Abstract:

We consider the application of a new Mathematica package BVPh 2.0 based on the homotopy analysis method (HAM) to the solution of a nonlinear ordinary differential equation system. The BVPh 2.0 is successfully applied to solve the stagnation flow of an electrically conducting incompressible viscous fluid towards a moving vertical plate in the presence of a transverse uniform magnetic field and the results are compared to results of the MATLAB routine bvp4c. The results reveal that the BVPh 2.0 can easly achieve good results in predicting the solutions of such problems.

Keywords: Stagnation Point, Newtonian Fluid, Magnetohydrodynamics (Mhd), Homotopy Analysis Method (Ham), Semi-Analytic Solution

FIRE PROPERTIES OF SCOTS PINE IMPREGNATED WITH FIRETEX

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Abstract:

One of the most negative features of wood material is being burnable. It has been using many chemical subtances that are preventing burning or fire retardant in order to overcome its negative feature. When a wood material burns, carbon monoxide (CO) which is one of the harmful gases occur. Thus, it cause poisoning mostly and sudden death.

In this research, it was aimed to determine fire properties of wood material which were applied firetex as being impregnated material and fire retardant that do not damage human's health. For this purpose, the burning experiments that were prepared by scots pine (Pinus sylvestris L.) wood, have been done according to ASTM-E 69 standards.

As a result of the burning experiments, the average amount of CO emission and the weight loss decreased at the wood samples impregnated with firetex, have been located. Moreover, while the average weight loss (23.68%) and amount of CO (50.98ppm) at the test samples, the average weight loss (55.15%) and amount of CO (94.68ppm) have been determined at the control samples as well.

According to these results, we found that firetex which is succeed to protect the public health against to the fire, and retarded the fire. In addition, we observed that it induced to decrease the fire smoke, therefore the using of it in wood structures is definitely recommended.

Keywords: Firetex, Wood Fire Retardant, Impregnated Material, Public Health

EVALUATION OF THREE REGRESSION METHODS FOR THE ABOVEGROUND BIOMASS ESTIMATION IN BEECH FOREST IN THE NORTH-EAST BOSNIA

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Abstract:

Forest aboveground biomass (AGB) has important role in carbon cycling and environmetal management. The AGB quantities and its spatial distribution on forested areas influence stand potentials and indicate places with rich or insufficient (low) biomass presence. Bosnian forests are native, multi layer, uneven aged with complex structure mainly. Their structures challange selection of suitable estimation method for quantity and spatial variability prediction. The aim of this research is to compare three estimation methods: ordinary leaste square (OLS), geographically weighted regression (GWR) and k nearest neighbours (k-NN) for AGB prediction in native beech forests on the study area named Majevica Jablanicka rijeka. Sample is consisted of ground data (269 sample plots) and spectral Landsat 8 data. The assesment of applied estimation models is conducted in terms of mean error, mean (absolute) error, RMSE and standard deviation of errors. The OLS and GWR models produce low positive mean errors (0.01 and 1.76, respectivelly) while k-NN results with large negative error (-15.98). The GWR estimates achived the lowest values of mean absolute error, RMSE and standard deviation of errors compared to other estimation methods. It seems that local variability has significant influence on predictions so the GWR can be assigned as the suitable estimation method for beech abovegroud biomass spatial estimation in this condition.

Keywords: Forest Aboveground Biomass, Native Beech Forest, Regression Estimation Methods, Landsat 8

SOLAR POWERED WILD ANIMAL DETECTION AND WARNING SYSTEM DESIGN FOR SUSTAINABLE HUNTING

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Abstract:

Hunting is carried out to sustain a balance between all of organisms and the environment in the ecosystem for maintaining the life. In the past, humankind could survive life and supply vital needs such as feeding, wearing and self-protecting only by hunting. Today, it is done in order to protect the fields, farms and residentals from wild animals and mostly by people who are going in for the hobby. The methods used have hardly changed throughout history except some of the weapons. Most preferred hunting methods are trapping and destruction without breed, sex and age choice indiscriminately cause removing many species from the ecosystem and thus faced with the risk of losing the balance. Selective methodes for dangerous wild animals, force to establish observation points as an old invention. Attacks of wild animals followed by people who were guarding in the observation point, which is established between two trees. But this methode requires many guard and long observation times. Moreover, this method also includes life-threatenings, incase wild animal attacks.

In this survey, we provided using an electronic detection and warning system, instead of guarding people. The system, which identifies the wild animals, once they enter to desired zone, via heat and motion sensitive sensors. And it will make an information call to pre-defined center via GSM module. Thus the danger to life for hunters will minimize and hunters will ensure that they are in the correct point in time. The energy, which is needed for the sensors and wireless communication equipments, supplied by Photovoltaic Modules (PV), which were designed and produced by us. Because it is assumed, that the system will be established out of urban zones. This “Solar Powered Wild Animal Detection and Warning System” is designed by the students of Karabuk University, Electrical and Electronics Engineering Department.

Keywords: Animal Detection, Hunting, Solar Module, Wild Animal Observation

FOAM CONCRETE PRODUCTION WITH A FLY ASH ADDITION

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Abstract:

Foam concrete is a lightweight concrete which at least 20% of the volume is composed of air voids. High fluidity, low unit weight, the minimum aggregate usage, controlled low strength properties and superior insulation properties make the foam concrete as a preferred building material. It can be produced 400 to 1800 kg/m3 in dry unit weight and compressive strength of ranges between 1 and 15 MPa. It has certain advantages like easy placement in the mould and pumping ability, does not require compression and vibration, reduction in labour costs. Foam concrete shows a high resistance against water and freeze-thaw effect. It has excellent sound and heat insulation properties as compared to normal concrete. Due to the advances in the production equipment and foaming technology, foam concrete has found a wide range of production and use in recent years.

In this study, fly ash were used as the main raw materials in the production of foam concrete blocks. Fly ash were used in this study is a by product waste which was obtained from the thermal power plant. The fly ash was used without grinding. It has particle size range of 1-200 microns. Water, aggregate and cement were respectively put into the mixer and the foam added in the mixture. Then the mortar was homogenized. When fluid consistency of the mortar was obtained, it was poured into the mould and placed in the oven for 6 hours to complete the setting time. Physical and mechanical tests were carried out on the samples removed from the oven. It was concluded that, the fly ash can be utilized in foam concrete production without harmful effect on the engineering properties of the product. Also this way can be a solution to the mass consumption of the mineral waste.

Keywords: Foam Concrete Blocks, Recycle, Fly Ash, Sustainable Production

BIO-OXIDATION OF PYRITE AND CHALCOPYRITE BY MARINOBACTER AQUAEOLEI UNDER MICROAEROBIC CONDITIONS

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Abstract:

Iron is a necessary nutrient for all known life forms, including bacteria [1]. Sulphide minerals such as pyrite and chalcopyrite serve as iron source for Fe-oxidizing bacteria. They can use Fe(II) minerals as electron donor and oxygen as electron acceptor through their cellular metabolism [2]. Marinobacter aquaeolei, a chemolithotrophic, neutrophilic bacteria, was first isolated from a Vietnamese oil-producing well [3] and is best known for the degradation of hydrocarbon compounds and the production of siderophores, but not previously for Fe-oxidation [4]. Therefore, the role of Marinobacter aquaeolei on Fe-oxidation remains poorly understood. The objective of this study was to investigate the effect of M. aquaeolei on the iron oxidation rates of pyrite and chalcopyrite.

The abiotic oxidation of Fe(II) under circumneutral and aerobic conditions is very rapid (<1 min) [5]. Therefore, the experiments were carried out at neutrophilic and microaerobic conditions. Serum flasks including 100 ml of sterile Halomonas medium, and sterile crushed (≤125 μm) pyrite and chalcopyrite were inoculated with M. aquaeolei. Duplicate sets of biotic and control flasks were incubated shaking at 150 rpm for 12 days. The leaching solutions were analyzed for total Fe ion concentrations and pH.

PH values of pyrite biotic and control solutions decreased overall. For chalcopyrite biotic solution, pH values increased initially, and decreased later. In contrast to pyrite, pH values of chalcopyrite biotic solution was higher than the chalcopyrite control solution during the interval. Researchers proposed a thiosulfate mechanism for the oxidation of pyrite, and a polysulfide mechanism for the oxidation of chalcopyrite [6]. Different pH behaviors of the minerals might be because of their dissolution mechanisms. The bio-oxidation rate of pyrite was higher than that of chalcopyrite. Total Fe concentrations in biotic flasks were higher than the corresponding controls. M. aquaeolei was found to oxidize pyrite and chalcopyrite under microaerobic/neutrophilic conditions.

Keywords: Marinobacter Aquaeolei, Iron Oxidation, Sulphide Mineral

INFLUENCE OF ENVIRONMENTAL DATA ON FOREST ABOVEGROUND BIOMASS NON-PARAMETRICAL ESTIMATES OF PRODUCTIVE FOREST IN MUNICIPALITY GRAČANICA

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Abstract:

Recently forest resources have become increasing interest as a source of wood production, biomass and carbon stocks, their protective, social and other function. Regular forest inventory provides plenty of data and information about forest attributes which are used for operational forest management. Relations between forest attributes as target variables and spectral, environmental and climate data as predictors challenge spatial variability estimation based on statistical classification methods. In this paper are analyzed and compared forest aboveground biomass (AGB) non-parametrical k-nn estimates based on inventory data solely and compiled inventory, environmental and climate data. Study area covers state-owned productive (high and coppice) mainly broadleaved forest in municipality Gračanica on the north-east Bosnia. Here are used ground forest inventory, spectral Landsat ETM and environmental (altitude, slope, aspect, cumulative temperature) data. Obtained results indicate that environmental and climate data contribute in reduction of root mean square errors of AGB broadleaves estimates about 19% in high forest and between 17% and 23% in coppice forest. Also it is found that transformation of slope and aspect data did not affect results significantly. These findings confirm significant role of environmental and climate data in AGB spatial variability prediction in similar condition.

Keywords: Forest Aboveground Biomass, Forest Inventory, Environmetal Data, Transformation, Landsat, Non-Parametrical Estimates

THE ROLE OF ENVIRONMENT ACTION PROGRAMMES IN THE DEVELOPMENT OF EU ENVIRONMENTAL POLICY

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Abstract:

The European Union by its sui generis character of supranational structure having its own law and institutions as a power above national states, has aimed the integration target while developing environmental policies like other policy fields. 1970s were the awareness period of environmental degradation for the sake of economic development in the world. That period also became awakening years for the European Union from the perspective of environmental protection. EU Member States have become to take common actions in environmental issues like other many fields. The Second World War did not only damage human and economic capacity of the European Continent but also deteriorated the European environment. Not much later of the establishment of the European Economic Community, EU introduced many legal and administrative arrangements from preventive to protective.

Environment action programmes have been the basis for the European Union in order to develop its environmental policies. EU has introduced seven environment action programmes so far. Each of them covers a specific period of time. While the first programme was covering the period of 1973 – 1976, the final (seventh) programme covers the period of 2014 – 2020.

Keywords: European Union, Environmental Policy, Environment Action Programme

INVESTIGATION OF EFFECTS OF PYROLYSIS PARAMETERS ON BIOFUEL PRODUCTION FROM POPPY CAPSULE PULP

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Abstract:

In this work, evaluation possibility of Poppy Capsule Pulp which is the main waste of Afyon Alkaloid Factory was investigated. The factory has been working for 30 years and accumulating waste Poppy Capsule Pulp in the plant area. Today, in this area approximately 20,000 tons of poppy capsule pulps are stored without any purpose.

The aim of the work is to produce biofuel via pyrolysis process of poppy capsule pulp, characterization of the biofuel and investigation of the effects of pyrolysis parameters on biofuel production. In previous work, proximate analysis of poppy capsule pulp was done and it was observed that poppy capsule pulp was a suitable waste material for biofuel production by pyrolysis. Pyrolysis experiments were conducted in a fixed-bed reactor at different peak temperatures between 300 and 500°C and two different heating rates of 10 and 18°C min-1 to determine the effect of temperature and heating rate on the biofuel production efficiency. Yields of liquid products are very close to each other and the highest yield of liquid product is obtained at 500 °C and 18 °C/dk heating rate (17 %). As another parameter, the experiments were repeated in nitrogen atmosphere. TGA analysis of poppy capsule pulp was done to investigate pyrolysis behavior of the waste and FTIR, GC-MS analysis of produced biofuel were done in order to determine the characteristics of biofuel.

Keywords: Pyrolysis, Poppy Capsule Pulp

THEORETICAL INVESTIGATION OF A SWIMMING POOL HEATING SYSTEM BY USING WASTE ENERGY REJECTED FROM AN ICE RINK TO UNDERGROUND ENERGY STORAGE TANK

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Abstract:

In this study, swimming pool heating system by using waste heat energy rejected from chiller unit of an ice rink to underground thermal energy storage (TES) tank has been theoretically investigated. Swimming pool and ice rink are assumed to be closed type, and they are considered to have been constructed in the city of Gaziantep. The system consists of a swimming pool, an ice rink, a spherical underground TES tank, a chiller and a heat pump. Total energy absorbed by refrigerant with the compressor of the chiller unit from the ice sheet is transferred to the underground TES tank and stored. Then, stored thermal energy is withdrawn by evaporator of the heating unit and transferred to the swimming pool. The analytical model which is developed to obtain thermal performance of the system is based on solution of transient heat transfer problem for the underground TES tank, and energy requirements of swimming pool and ice rink. The transient heat transfer problem is solved using a similarity transformation and Duhamel's superposition principle. A computer code is used to obtain the annual variation of swimming pool and ice rink energy requirements, water temperature in the TES tank, and system performance parameters depending on different swimming pool, ice rink, soil and TES tank parameters by using Matrix Laboratory (MATLAB) program. Results showed that operational time span of 5-7 years are necessary for obtain annually periodic operation condition. This means that after 5-7 years TES tank water temperature is not changed.

Keywords: Chiller, Heat Pump, Ice Rink, Swimming Pool, Waste Energy

THE THERMODYNAMIC ANALYSIS OF A BETA TYPE RHOMBIC DRIVE STIRLING ENGINE

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Abstract:

This paper presents a theoretical investigation on kinematic and thermodynamic analysis of a beta type Stirling engine with rhombic-drive mechanism. Variations in the hot and cold volumes of the engine were calculated using kinematic relations. The effects on engine performance of rhombus length were calculated using nodal analysis in FORTRAN for 200, 300 and 400 W/m2K convective heat transfer coefficients. The variation of engine power with charge pressure was obtained by using the same convective heat transfer coefficients. The optimum rhombus length for 400 W/m2K the convective heat transfer coefficient and 2 bar charge pressure was obtained as 80 cm. In this condition, the maximum engine powers for 300,400 and 500 W/m2K the convective heat transfer coefficients were estimated as 134.96 W, 240.416 W and 324.29 W respectively.

Keywords: Stirling Engine, Rhombic Drive Mechanism, Beta Type Engine, Thermodynamic Analysis

A REVIEW ON CARBON DIOXIDE (CO2) EMISSIONS AND ENERGY CONSUMPTION IN CERAMIC MANUFACTURING INDUSTRY, TURKEY AND AN EXPERIMENTAL RESEARCH IN CERAMIC TILE PRODUCTION

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Abstract:

In the ceramic industry, over 70% of the emissions from the manufacturing are created in the firing process. Process emissions vary between product groups, mostly due to the mineral composition of the clay and the raw material mix. Carbon dioxide emissions are dependent on the mineral composition of the raw materials, which in most cases consists mainly of the locally available clay. According to the new text of the Emissions Trading Scheme, ETS Directive, known as the climate change scheme, it will be mandatory for all combustion units to be included in the greenhouse gas permit in all ceramic installations in Turkey like in the countries of European Union. To this end, an experimental study in ceramic tile production is conducted. New ceramic wall tile formulations are developed by incorporating alternative raw materials in order to decrease firing process emissions and energy consumption. As a result, a noticeable reduction in drying and firing emissions (12.5%) and in energy consumption has been obtained.

Keywords: Carbon Dioxide Emission,Emissions Trading Scheme, Ceramic Industry, Energy Consumption, Tile.

ANAEROBIC TREATABILITY AND BIOGAS PRODUCTION POTENTIAL OF AUTOMOTIVE INDUSTRY WASTEWATERS

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Abstract:

Metalworking fluid wastewater poses a potentially high risk to the environment when disposed of without previous treatment due to the high organic load. Disposal of this waste through a biological process is an attractive option, since it is cost-effective, with a relatively low energy demand. The main sources of wastewater discharges of automotive industry are spent metalworking fluids which are rich in oil, grease, heavy metals. In terms of efficiency, the organic matter content of wastewater treated using the anaerobic treatment methods requires in high levels. Thus, in this study, using wastewater of automotive industry and molasse as co-substrate were carried out using UASB reactor. The wastewater in this study was previously treated by physical-chemistry process to remove oil and heavy metals. The experiment was conducted in the 7.5 L UASB reactor which had internal diameter of 100 mm and a height of 1000 mm at mesophilic temperature (37 0C) .The organic loadings rate (OLR) applied 3-4-5 g COD/L d, with a constant hydraulic retention time (HRT) of 48 h. The chemical oxygen demand (COD) removal rates were found to be % 67-81, % 71-80 and %68-73 and biogas yields were determined as 0.39-0.44 L biogas/g COD removal, 0.55-0.79 L biogas/g COD removal and 0.31-0.50 L biogas/g COD removal, respectively. The data was then applied to the Stover-Kincannon and Monod model and Rmax, Ks, Umax and KB values were determined. Besides, SEM and FTIR analyses was employed in order to show the structural changes of anaerobic sludge after UASB reactor.

Keywords: Upflow anaerobic sludge blanket reactor, anaerobic treatment, automotive industry, biogas, SEM, FTIR, kinetic models

REMOVAL OFDICLOFENAC BY THE CATALYTIC WET PEROXIDE OXIDATION

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Abstract:

Diclofenac (DCF), an endocrine distruptor, is one of the widely used pain-reducing drugs. In this study, the removal of DCF by the catalytic wet peroxide oxidation (CWPO), which is an economical and environmentally friendly advanced oxidation processes (AOPs), is investigated. Titanium-pillared bentonite (Ti-PB) was synthesized to be used as the catalyst for the CWPO. The morphology, crystal structure, and surface properties of the Ti-PB catalyst were determined by scanning electron microscopy, chemical analysis, X-ray diffraction patterns (XRD), and N2-adsorption/desorption isotherm analyses. Oxidation studies were carried out to determine the effects of the concentrations of catalyst and DCF, pH, and temperature on catalytic activity. The XRD patterns verified the formation of a delaminated structure characterized by non-parallel distribution of the clay layers during pillaring with Ti pillars, and that the titanium is incorporated into the structure as TiO2 (anatase). The results of chemical analysis also confirmed the incorporation of the titanium into the structure. The analysis of the N2- adsorption isotherms showed a type IV isotherm that indicated the presence of micro- and mesopores in the structure. The BET surface area was determined as 212 m2/g for the Ti-PB calcined at 400°C. The catalytic activity results indicate that the oxidation rate increases with increasing catalyst concentration. It was found that upon 60 minutes of oxidation, DCF removal increased from 52.6% to 99.9% when the concentration of the catalyst was increased from 1 g/L to 3 g/L. Conversely, although it was observed that the DCF removal rate increased when DCF concentrations were increased from 5 mg/L to 10 mg/L, increasing the DCF concentration beyond 10 mg/L decreased the DCF removal rate. Furthermore, it was observed that increasing the temperature also increased the DCF removal rate, whereas increasing the pH decreased the removal rate.

Keywords: Titanium-Pillared Bentonite, Diclofenac, Catalytic Wet Peroxide Oxidation

EFFECT OF ENVIRONMENTAL CONDITIONS ON THE GROWTH OF TOXIC CYANOBACTERIA

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Abstract:

Eutrophicaiton is a common and growing environmental problem in water sources used for drinking, agricultural, industrial, commercial and recreational purposes. This has led to growth of cyanobacteria in fresh water and can negatively impact the water quality. Various unpleasant taste and odor problems can occur. Excessive cyanobacterial blooms can clog filters; increase coagulant demand and formation of disinfection by product such as thrihalomethanes and chloroacetic acids. In addition, specific cyanobacterial species are known to produce toxins. Microcystis aeruginosa is well-known toxin-producing cyanobacteria and commonly observed in eutrophic waters. The microcystins produced by Microcystis aeruginosa are the main types of cyanobacterial toxins which hazard to human. The human health effects of these toxins include gastroenteritis, cytotoxicity, hepatotoxicity and neurotoxic effects. The frequency and intencity of toxic cyanobacteria is expected to increased a result of environmental condition changes. The purpose of this study was conducted to examine the impacts of different environmental conditions such as light, temperature and nutrients on the growth of toxic cyanobacteria, Microcystis aeruginosa, and then applied on fish (Lepistes sp.) by using traditional toxicity test to find out acute toxicity. From the results of the tests, the lethal dose on Lepistes sp. were obtained corresponding to the highest growth rate of toxic cyanobacteria.

Keywords: Eutrophication, Cyanobacteria, Microcystin, Environmental Conditions, Lethal Dose

TREATMENT OF SYNTHETIC TEXTILE WASTEWATER WITH ANAEROBIC MEMBRANE BIOREACTOR

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Abstract:

This study aims evaluating anaerobic MBR for the treatment of azo-dye containing synthetic wastewater. Also, the filtration performance of AnMBR was investigated. Synthetic wastewater consisted of varying concentrations of remazol Brillant Violet 5R (RBV-5R) (0-200 mg/L) as model dye compound, glucose as organic source (1000 mg/L) and the required nutrients, i.e. N,P and trace elements. The performance of the anaerobic MBR was investigated at varying dye concentrations (0-200 mg/L) and the HRTs (1-2 days). Total volume of the lab scale anaerobic MBR was around 5.7 L. Flat sheet PES membranes with 0.45 µm pore size was used in the reactor. In order to scour the cake layer deposited on the membrane, the produced gas was recirculated to the MBR with a rate of 1 m3gas/(m2 membrane.h). In the reactor, high COD removal efficiencies (>90%) and almost complete color removal were observed. Generally, the produced methane amount was in good agreement with the theoretically calculated value. AnMBR was successfully operated up to 9 LMH and was operated at 4,5 LMH for around 50 days without chemical cleaning. The SMP concentrations in the supernatant and the permeate of AnMBR averaged 33±29 mg COD/L and 10±5 mg COD/L, respectively, corresponding to around 70% SMP rejection by the membrane. Although EPS concentration stayed relatively stable 146±60 mg/g MLVSS, it increased significantly when dye concentration was increased together with decreasing HRT. In the MBR, offline chemical cleaning with NaOCl and sulfuric acid almost completely removed irreversible fouling and the resistance of chemically cleaned membrane was close to those of new membrane.

Keywords: Anaerobic Membrane Bioreactor, Color Removal, Fouling, Membrane Bioreactor, Textile Industry Wastewater.

THE INVESTIGATION OF THE ANTIMICROBIAL EFFICIENCIES OF THE TEXTILE IMMOBILIZED AG-NHC (N-HETEROCYCLIC CARBENE) COMPLEXES

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Abstract:

In this study antibacterial and antifungal efficiencies of the Ag-NHC (N-Heterocyclic Carbene) complexes which were binded to textiles were investigated. For this purpose, Ag-NHC (N-Heterocyclic Carbene) complexes were applied to cotton fabrics according to padding method at room temperature. After application five washings were performed at 60° C by the laboratory type dyeing machine. 4 g/lt washing chemical were used in washings. At the end of the last washing cotton fabrics were dried at 110° C for four minutes at laboratory type mini dryer. Antibacterial and antifungal efficiency tests were performed according to AATCC 147. It was seen that unwashed and washed fabrics are all efficient against to six microorganism (S.Aureus, E.Faecium, E.Coli, P.Aeruginosa, C.Albicans, C.Tropicalis).

Keywords: Textile, Cotton, Silver, Antibacterial, Antifungal

TREATMENT OF TEXTILE INDUSTRY EFFLUENT WITH PILOT SCALE MEMBRANE BIOREACTOR

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Abstract:

Membrane bioreactor (MBR) is an effective method for domestic and industrial wastewater treatment applications. MBR has many advantages over conventional treatment systems such as, high effluent quality, smaller reactor volumes and allowing high MLSS concentration. Performance of a pilot scale MBR treating an industrial zone wastewater located in Bursa/Turkey was investigated. A flat sheet membrane with the pore size of 0.22 µm was used in the reactor. The active volume of the MBR system was 1 m3. In the first 17 days, the MLSS concentration of reactor was 3.5 g/L. Then, MLSS concentration was increased to around 11.5±1.5 g/l. Without chemical cleaning, the MBR was operated up to 9 LMH flux rate and the highest flux with the chemical cleaning with NaOCl was 14.5 LMH at 11.5±1.5 g/l MLSS concentration for around 33 days. Up to 92% COD, 61% color, 99% ammonium and 53% dissolved phosphor was removed from influent wastewater.

Keywords: Membrane Bioreactor, Color Removal, Fouling, Industrial Wastewater, Membrane Bioreactor Cleaning

HAZARDOUS WASTE DISPOSAL BY INCINERATION AT IZAYDAS

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Abstract:

Industrialization is one of the mandatory requirements of the modern communities. Although human changes the existing environment by using the technological facilities and capabilities, industrial waste which are result of technologic processes, are majorly hazard to the environment. The rapid economic development of industrial activities accelerates the increase of hazardous waste production. In the waste management hierarchy, the first choice is the recycling and recovery after the following preventing steps, reducing and reusing. However, in cases where it is not possible to recycle, incineration is one of the important methods, which can be used for hazardous waste disposal. For a long time, incineration is being used as a promising method for disposal of combustible waste. IZAYDAS is the first incineration plant for hazardous waste in Turkey and was established in 1996 by the Metropolitan Municipality of Kocaeli. IZAYDAS works in order to the regulations of Turkish Ministry of Environment and Urbanization, which are in based on European directives. The plant has an incineration capacity of 5.400 kg/hour. In 2014, 31.289 tons of hazardous waste disposed by incineration and 83.816 tons of hazardous waste disposed by hazardous landfilling. During the incineration process IZAYDAS produced 12.093.500 kWh electricity. Between 1997-2014 a total of 333.342 tons of hazardous waste was disposed by incineration. 191.315.900 kWh electricity was produced and 76.541.050 kWh of it was sold to TEIAS Turkish Electricity Transmission Company). IZAYDAS has also a sanitary hazardous waste landfill. 619.073 tons of Hazardous Waste landfilled since 1997. In this study, an investigation was performed on incineration of hazardous wastes. Investigations were concentrated especially starting from plastic wastes to hazardous medical wastes. The discussions were performed on these hazardous waste disposal by incineration in IZAYDAS was investigated.

Keywords: Hazardous Waste, Waste Management, Incineration Technologies, Izaydas

INVESTIGATION OF RELATIONSHIP WITH HEALTH PROBLEMS AND ENVIRONMENTAL PROBLEMS IN THE SILIVRI DISTRICT OF ISTANBUL

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Abstract:

The purpose of this study is to investigate relationships with health problems and environmental problems in the district of Istanbul.

This study is a cross-sectional questionnaire study that was conducted in the Silivri between the dates of 25th May-24th July 2015. Questionnaires were conducted to 221 people living in Silivri with face to face interviews by researchers.Average age of participants was 45,86±15,71. %47 of the sample were female, %53 were male. The most common occupations were worker(%36,7) and housewife(%26).

Most of participants (%82,4) thought the presence of hazardous environmental factors, deteriorating their health, found in their neighborhood(n:182). Water pollution (48,4%, n:107) and absence of free water (50,7%, n:112) were the most common complaints of the participants. Heating problems (1,8%, n:4) and dangerous waste products (2,3%, n:5) were rarely expressed by the population.

Analyzing distribution of factors which disrupt health and history of chronic disease to urban and rural areas revealed more complaints about those factors and diseases in the rural areas than urban areas.(p:0,001, p:0,013, respectively).

Questioning of participants about chronic diseases indicated that most common diseases were hypertension (%15,8, n:35) and chronic lung diseases(%10,4, n:23). In other respects obesity and cancer were rare health problems in this population(%2,3, n:5 and %0,9,n:2, respectively). Percentage of people to have chronic disease on their children was %3,6(n:8).

Silivri people reported a lot of environmental problems which impair the public health. Although it is known that people which living in rural areas have healthier life and lesser exposure to environmental pollution than the people which living in urban area. In our study, people that living in villages close to industrial zone and seas which have marine pollution have more history of diseases and report more factors that negatively influence the health than people living in urban area.

Keywords: Health, Environment, Pollution, Disease, Prevention

EDUCATION AND KNOWLEDGE OF MEDICAL STUDENTS ABOUT ENVIRONMENT

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Abstract:

Introduction: The aim of the efforts made to protect, improve and rehabilitate the environment in the community is to allow humans to live in a healthier and safer environment. The aim of this study was to determine the level of knowledge of the students attending a medical faculty about the environment and environmental awareness and to highlight education programs that will be organized in this area.

Material and Method: The study is a descriptive, cross-sectional study conducted between September 1 and October 31, 2013. A questionnaire form, which was prepared by the investigators, was applied to the students by face-to-face interview. The data were evaluated by frequency, percent, ratio and chi-square test.

Results: The mean age of the subjects who participated in the study was 22.95 ±3.56 years (min=17; max=30). 49.4% of these subjects were female and 50.6% were male. 49.4% students were in the final class and 50.6% students were in the first class. 57.3% of the students lived their childhood in big cities and 23.6% lived their childhood in rural areas. When we asked about the interest of the parents of the students included in our questionnaire study for environmental problems, 42.7% of them stated that their parents did not have much interest and 36% stated that their parents had adequate interest. When the questions given by the first and sixth class students were compared statistically, it was observed that environmental awareness was higher in the sixth class students (χ^2 = 9,748, p=0.021).

Conclusion: Education and teaching of young people in the subject of establishing environmental consciousness and environmental awareness should not be omitted and should be continuous. In this study, it was noted that the knowledge of medical faculty students about environment and their environmental consciousness increased over time.

Keywords: Medical Students; Environment; Education; Attitudes

PHOSPHORUS RECOVERY FROM SEWAGE SLUDGE FILTRATE

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Abstract:

Phosphorus (P) is one of the fundamental element for all living organisms, also the phosphate reserves are rapidly being depleted in the world. Therefore phosphate should be recovered various source such as wastewaters, sludge, sludge ash. The recovery technologies for phosphorus are developing day by day. While recovering the phosphorus, pipeline's clogging problem which is one of the most important problem in wastewater treatment facilities is minimized and sludge storage problem decrease.

In this study, phosphorus recovery potential of filtrate which obtained by electro dewatering process was investigated. In this process, recycled sludge of secondary settling tank of Bolu Municipal Wastewater Treatment Plant was dewatered at the model electro-dewatering systems. The sludge filtrate (effluent water) obtained after electro-dewatering processing was used for recovering of phosphorus as a struvite (MAP). Pumice stone was used as a seeding material. A Box-Benhken experimental design was used to determine the effects of temperature, mixing time and concentration of the added magnesiumhydroxide on phosphorus recovery efficiency from the sludge filtrate and to determine the optimum conditions. Box-Behnken designs are experimental designs for response surface methodology and it offers the advantage of requiring a fewer number of runs for three factors. The response function coefficients were determined using MINITAB 17.0.

According to the results, when predicted and observed phosphorus recovery values are compared R squared was found 0.91. The maximum optimum condition was found at 800C sample temperature, 2.0 M magnesium hydroxide concentration and 45 minutes mixing time and the maximum value for phosphorus recovery was found as 15.81 mg PO4-P /L. According to the experimental results, phosphorus recovery is reached 37 percent. Temperature of the sample and added magnesium hydroxide concentration are the most effective parameters on phosphorus recovery.

Keywords: Phosphorus Recovery, Sewage Sludge, Struvite, Map, Electro Dewatering Process, Box-Behnken

PHOSPHORUS RECOVERY FROM SEWAGE SLUDGE FILTRATE

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Abstract:

Phosphorus (P) is one of the fundamental elements for all living organisms, also the phosphate reserves are rapidly being depleted in the world. Therefore phosphate should be recovered various source such as wastewaters, sludge, sludge ash. The recovery technologies for phosphorus are developing day by day. While recovering the phosphorus, pipeline's clogging problem which is one of the most important problem in wastewater treatment facilities is minimized and sludge storage problem decrease.

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Keywords: Phosphorus Recovery, Sewage Sludge, Struvite, Map, Electro Dewatering Process, Box-Behnken

ENERGY-EFFICIENT ENVELOPE DESIGN FOR HIGH-RISE APARTMENTS IN ERBIL CITY

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Abstract:

Since the building envelope is the barrier that separates the indoor space from the outdoors. [1] The architectural envelope has long been a compelling focus ofinterest for building physicists and designers, combining attributes of both appearance and performance in a holistic manner. Building envelopes form the outer skins of buildings, portraying the project image and creative intent. [2] It is important to collaborate with the architects to help guide decisions that will improve the thermal envelope's performance. Determine the greatest sources of heat gains and losses through the building's skin, and look for opportunities to minimize the effect. [3,p.161] however Thousands of buildings have been designed and built with a goal of energy performance. Some are formally recognized as sustainable structures using a variety of criteria including energy performance, e.g., those with USGBC LEED certification. However, many of these buildings offer less than desirable operating efficiencies, often a short time after construction. [4] This paper presents a simulation case study of envelope preliminary design options for the new construction building of PARK VIEW residential building in Erbil city. In this paper, the importance of envelope design has been covered under two segments.

Keywords: Energy-Efficient Envelope Design, Sustainable buildings

PERFORMANCE AND EMISSIONS CHARACTERISTIC OF DIESEL LIKE FUEL DISTILLATED FROM TIRE OIL

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Abstract:

In this study, performance and exhaust emission characteristics of a Diesel engine are investigated by using Diesel-Like Fuel (DLF) produced from waste tire oil (WTO). These characteristics such as engine torque, engine power, brake specific fuel consumption (Bsfc), exhaust temperature, nitrogen oxides (NOx), sulfur dioxides (SO2), carbon monoxides (CO) and total unburned hydrocarbon (HC) are tested. The DLF is distillated at fixed bed system that consists of filters, a reactor, condenser, collector, thermocouple and an electronic panel. As for the fuel properties of DLF; its viscosity, density, heating value, flash point, sulfur content and distillation characteristic are also tested. Many of the thermophysical and chemical properties and distillation curves of the DLF are seen to be similar to diesel fuel. The results for torque, power, and Bsfc are also quite close to those of diesel fuel. Brake thermal efficiency is decreased while the Bsfc is a little increased for DLF. Emission characteristics are good agreement with those of the diesel fuel. It can be concluded that the DLF can be combusted in a diesel engine without any problem

Keywords: Tire Oil, Pyrolysis, Diesel Fuel, Diesel Like Fuel, Engine Performances, Exhausts Emission

HEAVY METAL HYPERACCUMULATOR PLANTS IN THE BRASSICACEAE FAMILY AND THEIR POTENTIAL FOR PHYTOREMEDIATION

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Abstract:

Heavy metals play important roles in the growth and development of all organisms when present in trace amounts. However, increased levels can lead to serious cases of toxicity and even death. Heavy metals can accumulate in the environment by various means including industrial by-products, sewage, fertilizers, pesticides, burning of fossil fuels etc. In order to fight the problem of heavy metal accumulation, researchers have come up with various methods of soil decontamination. A cheap and promising method is phytoremediation, the use of plants for accumulation and removal of pollutants from the environment. A special group of plants known as hyperaccumulators has distinguished itself by their capacity to accumulate high amounts of heavy metals. These plants are found in different plant families but share many properties that make them a promising tool in the process of phytoremediation. Out of the discovered hyperaccumulators, 25% belong to the family Brassicaceae. Herein, a brief overview of the properties of Brassicaceae hyperaccumulators and the prospects for their use in phytoremediation of heavy metals is presented.

Keywords: Heavy metals, phytoremediation, hyperaccumulator, Brassicaceae

EVALUATION OF METAL IONS OF PERMEABILITY- REMOVAL RATE RELATIONS IN THE NATURAL , COMPACTED AND CONSOLIDATED CLAY SOILS

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Abstract:

Many cities in the Turkey use groundwater as their primary source of drinking water. Municipal solid waste landfills in all of the cities are major threat for groundwater. Low hydraulic conductivity clay liners by landfill operators are used as a standard practice. However it has been shown that certain contaminants change the structure of clay liners, making them highly permeable. A lot of investigators have shown that concentrated organic chemicals can alter compacted clays and cause increasing hydraulic conductivity.

In this study, the effects of leachates on hydraulic conductivity and the treatment capability of natural clay, compacted clay, and compacted and consolidated clay soil have been investigated. Clay soil samples were obtained from the Şile-Kömürcüoda landfill on the Asian side of Istanbul.

In the experimental studies, chemical, physicochemical and sieve analyses of clay soil have been analyzed. The microstructure of the clay soil are studied by scanning electron microscopy (SEM). Standard Proctor compaction tests and consolidation tests were applied to the clay soil obtained from the Şile-Kömürcüoda landfill area. The soil samples have hydraulic conductivity k of between 1.10-5-1.10-7 cm/s. In order to determine the removal rate of the natural clay, compacted clay, and compacted and consolidated clay soil Pb, Cu, Mn, Fe are measured in the influent and effluent of the lab-scale reactor. The effects of leachates on the hydraulic conductivity of natural clay, compacted clay, compacted and consolidated clay soil samples have been analyzed.

First, some decrease has been observed in the clay hydraulic conductivity associated with the contamination. The suspended solid matters in the leachate have filled the spaces between the particles of the clay soil pores and this caused a decrease in the hydraulic conductivity. After some time, these results show that leachates may cause increase in the hydraulic conductivity. The treatment capabilities of natural clay, compacted clay, compacted and consolidated clay soil samples were quite high. The highest removal rates and the lowest hydraulic conductivity are obtained in natural clay, compacted and consolidated clay, compacted clay, respectively.

Keywords: Hydraulic Conductivity, natural clay, compacted clay, consolidated clay, leachate, metal ions.

EVALUATION OF CHEMICAL PARAMETERS OF PERMEABILITY-REMOVAL RATE RELATIONS IN THE NATURAL, COMPACTED AND CONSOLIDATED CLAY SOILS

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Abstract:

Solid waste landfills are a major problem and cause significant threat to groundwater and surface water. Municipal solid waste (MSW) is also a major problem in Turkey, as in many other countries. İstanbul, with a population of 14.2 million, is the crowded city in Turkey and approximately 14,000 tonnes of MSW are collected daily.

In this study, the effects of leachates on hydraulic conductivity and the treatment capability of natural clay, compacted clay, compacted and consolidated clay soil have been investigated. Clay soil samples were obtained from the Şile-Kömürcüoda landfill on the Asian side of Istanbul.

In the experimental studies, chemical, physicochemical and sieve analyses of clay soil have been analyzed. The microstructure of the clay soil is studied by scanning electron microscopy (SEM). Standard Proctor compaction tests and consolidation tests were applied to the clay soil obtained from the Şile-Kömürcüoda landfill area. The soil samples have a hydraulic conductivity k between 1.10-5-1.10-7 cm/s. In order to determine the removal rate and hydraulic conductivity of the natural clay, compacted clay, compacted and consolidated clay soil COD, SS, TKN, Total P are measured in the influent and effluent of the lab-scale reactor.

It is concluded that in the beginning some decrease has been observed in hydraulic conductivity of the clay soil, associated with the contamination. A decrease in the hydraulic conductivity caused by the suspended solid matters in the leachate filling the spaces between the particles of the clay soil pores. After a certain time, these results show that leachates may cause increase in the hydraulic conductivity. The treatment capabilities of natural clay, compacted clay, and compacted and consolidated clay soil samples were quite high. The highest removal rates and the lowest hydraulic conductivity are obtained in natural clay, compacted and consolidated clay, compacted clay, respectively.

Keywords: Hydraulic conductivity, natural clay, compacted clay, consolidated clay, leachate, chemical parameters.

PROPERTIES AND USE OF THERMAL WATER AND PELOID OF SANDIKLI HÜDAI SPA (SW OF TURKEY)

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Abstract:

Hüdai spa is located in southwest of Sandıklı geothermal field in Afyonkarahisar. Thermal water are used with and peloid in healing applications in the spa were investigated in many aspects. The Hüdai spa is famous and used by many people throughout the country for therapy and healing (e.g., rheumatic muscular-skeletal diseases).

The temperature of the pool water and discharge water are 41 and 68 °C, respectively. These waters are characterized as Na/Ca-carbonate and sulphate. Average total dissolved solids (TDS) value of 720 and 1260 ppm and pH of the waters are 7.9 and 6.6, respectively. The peloid was prepared from alluvial soils formed from host rocks at around of spa and then used after maturation with thermal water. Particle size of the peloid is mostly clay and silt-sized. Mineralogical composition of the peloid formed from mostly clay minerals (e.g., smectite, illite, kaolinite, chlorite) and other silicates (quartz, feldspar). According to chemical analyses, the peloid can be compared to commercial peloids. CaO, K2O, As, Pb, Ba, Rb, and Sr content of the peloid are higher than the commercial peloids and Al2O3 and SiO2 content are lower. Geoaccumulation index and contamination factors were also calculated for peloid. Some of the element contents are higher than the standart limits and it can be cause negative affect.

In addition to mineralogical and chemical analyses, physical characteristics of the peloid were also determined (e.g. viscosity, cooling index, BET surface area etc). Some of the parameters were inadequate to use peloid for healing purposes. These negative parameters needed to be eliminated to use peloid for therapy.

Keywords: Sandıklı, peloid, pelotherapy, thermal water, clay.

ON USING OF THE ADVECTION-DIFFUSION PROBLEM AS ENVIRONMENTAL MODELLING

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Abstract:

In this study, we investigate numerical solution of one-dimensional linear advection-diffusion equation. Many physically realistic problems in atmospheric model actually involve some amount of diffusion. The advection-diffusion equation is an unsteady state flow problem. It benefits from applications in different areas such as environmental and mechanical engineering, heat transfer, soil science, petroleum and chemical engineering,etc. . The numerical solution of this problems with initial condition and boundary conditions is useful to assess the time and position at which the concentration level of the pollutants will start affecting the health of the habitats in the polluted water eco-system. Also such solutions help estimate and examine the rehabilitation process and management of a polluted water body after elimination of the pollution. It is important to solve advection-diffusion equation in real cases. Our aim is to show the convergence of the approximate solution for the model problem.

Keywords: Advection-diffusion equation, Galerkin method, atmospheric model.

STRUCTURAL AND SURFACE PROPERTIES OF NATURAL PRODUCT ORIGINATED ACTIVATED CARBON

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Abstract:

Tea plantation is one of the main agricultural activity in Rize province of Turkey. Every year 1,3 million tons of tea is obtained from 75000 hectare of tea gardens. By the regulation of government 15 % of gardens must be pruned for renewing of old plants [1, 2]. So this means that 7500 hectares of tea garden's waste has become rubbish. This kind of agricultural side products are good candidate of activated carbons ,which with high surface area and variable pore volume materials that their properties varied by material's origin and synthesis methods, to use them on same applications such as removal adsorption, air-gas purification and catalysis. Reusing of tea tree industry's sub-products is a way of economical gain for tea manufacturer and countries [3, 4].

In current study, we use camellia sinensis from north-east region of Turkey to produce activated carbon for some certain application. Both physical and chemical activation were examined by using KOH and ZnCl2, then resulting product was analyzed by FTIR, TGA, SEM and N2- Adsorption-Desorption methods. In the light of data collected from synthesized activated carbon, surface area value of KOH treated activated carbon is higher. It is also proved by the size and number of micro pore on the surface of KOH treated activated carbon. In N2- Adsorption isotherms, it is clearly seen that pore size decreased and contrarily number of micro pore increased so surface area acutely increased . The secret is how KOH is interacted with surface of plant tissue. During activation, K atoms penetrate into carbon particles and generate new pores between these particles [5]. KOH treatment rearranged the pores like a honey comb model. The new pore type improves the surface area because of its uniformity and shape.

In conclusion, for the aim of utilization of huge amount of tea tree waste, we synthesized tea tree activated carbon which is possibly usable as adsorbent for removal of wastes, catalyst supporter and medical and pharmaceutical applications. By using these wastes, we help to protect environment because all these wastes just burnt to disposal and we also convert a waste to and economically product.

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Keywords: Activated carbon, adsorption, pore volume, surface area, tea tree

TOLERANCE OF HYACINTH (HYACINTHUS ORIENTALIS L. C.V. "BLUE STAR") TO LEAD CONTAMINATED MEDIA

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Abstract:

The objective of this study was to determine the tolerance of hyacinth (Hyacinthus orientalis L. c.v. "Blue Star") as a hyper accumulator plant to lead contaminated media. This research was carried out in a completely randomized experimental design with three replications in green house conditions. Four doses of lead (control, 20 mg kg-1, 40 mg kg-1, 80 mg kg-1) were applied to each growing media having 500 g soil:sand mixture in 2:1 ratio. The distillate water was used in irrigation and hoagland solution was applied for fertilization. At the end of the experiment, effects of lead applications on all of plant growth criteria and flowering were found significant ($P<0.01$) except leaf number and stem diameter. The lowest first flowering time, full flowering time and first floret withering time were obtained as 77.00 day, 79.20 day and 82.39 day in control. The highest plant length and flower length were obtained as 229.91 mm and 146.36 mm in 20 mg kg-1 lead application. The highest flower diameter and floret number were found as 63.03 mm and 42.42 in 40 mg kg-1 lead application. Generally, while the lead doses increased flowering time, leaf length, plant length, flower length, flower diameter and floret number increased.

Keywords: Hyacinth, lead, tolerance, plant growth, flowering.

TOLERANCE OF DAFFODIL (NARCISSUS POETICUS L. C.V. "ICE FOLIES") TO NICKEL CONTAMINATED MEDIA

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Abstract:

Measurements have been made to identify modification of the γ-ray transmission factors of various construction materials according to percentage increasing concentration of boron waste by using a narrow-beam-geometry at 59.5 keV. Photons passed through different samples were detected with a very sensitive Si(Li) detector. We have made to investigate experimental results and these results discussed İn this paper.

Keywords: Boron waste, construction materials, transmission factors.

TREATMENT WITH VARIOUS CONSTRUCTION MATERIALS OF BORON WASTE IN DIFFERENT PROPORTIONS

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Abstract:

The objective of this study was to determine the tolerance of daffodil (Narcissus poeticus L. c.v. "Ice Folies") as a hyper accumulator plant to nickel contaminated media. This research was carried out in a completely randomized experimental design with three replications in green house conditions. Four doses of nickel (control, 25 mg kg-1, 50 mg kg-1, 75 mg kg-1) were applied to each growing media having 500 g soil:sand mixture in 2:1 ratio. The distillate water was used in irrigation and hoagland solution was applied for fertilization. At the end of the experiment, effects of nickel applications on leaf length, plant length, flower length ($P<0.01$) and flower diameter, stem diameter ($P<0.05$) were found significant, except leaf number and leaf length. The lowest first flowering time, full flowering time and first floret withering time were obtained in control and 75 mg/kg nickel application. The highest leaf length (341.60 mm), plant length (418.24 mm), flower length (70.74 mm) and stem diameter (7.63 mm) were obtained in 75 mg kg-1 nickel application. The highest flower diameter was found as 78.35 mm in 25 mg kg-1 nickel application. Generally, while the lead doses increased flowering time, leaf length, plant length, flower length, flower diameter and floret number increased.

Keywords: Daffodil, nickel, tolerance, plant growth, flowering

THE USE OF CRUMB RUBBER ASPHALT CONCRETE AND SUSTAINABLE IMPACT ON THE ENVIRONMENT

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Abstract:

Increasing the number of tire production and transportation of the rapid advancement of technology and thus causes an increase in the amount of waste tires. Tires become waste after the end of its life, it has become a major environmental problem that threatens human health. Tires produced from natural and synthetic rubber consisting of durable high molecular polymers for Environment, used and stored after they complete their life force, the growth of harmful bacteria quite as favorable environmental health problems are encountered. Waste materials are tried to be consumed by various methods. Burning waste rubber consumption is one of these methods. Although this is an easy and inexpensive method incineration of waste tires creates a problem in terms of environmental pollution. This method is prohibited in many countries. Research on availability and production as building material recycling waste materials are made in the last thirty years. Waste tires need concrete, as well as widespread use in asphalt concrete pavement. One of the key areas that use recycled scrap tires evaluated in many different areas are also road construction and maintenance works. Recycled scrap vehicle tires, quiet asphalt, porous asphalt, such as asphalt mixtures are used in the production of various high-quality asphalt.

This is a problem all over the world are being tested different methods to reduce partly. The average recycling complete the evaluation of the 30 million tires each year life in Turkey; environment, the natural balance and therefore it is essential to human health. In this study, in today's conditions rapidly depleted of natural resources, waste rubber granules widely used as an alternative to quarried aggregates used in asphalt concrete supplied and performance was examined. Ever tried to use scrap tires in asphalt and produced in a different way from the ground and used methods. Supported in the electron microscope photograph, it has provided a positive contribution to the performance of the mixture through a structure similar to popcorn.

Keywords: Waste tires, rubber, asphalt concrete, environmental.

POTENTIAL FOR REUSE OF POTATO SOLID WASTE ANAEROBIC DIGESTATE AS LAND FERTILIZER

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Abstract:

The objective of this research was to assess the degree of biological stability of fresh potato solid waste anaerobic digestate in order to determine the potential for its reuse as a soil conditioner and land fertilizer.

The fresh digestate was composted in Costech Respirometer 3022, a device that determines the degree of sample's biological stability measuring Dynamic Respiration Index (DRI). In order to attain optimal moisture concentration for digestate's aerobic stabilisation by composting, the sample was dehydrated by filtering and mixing with sawdust in 50:50 ratio.

The characterisation of inlet and outlet substrate and generated leachate was carried out. The leachate was analysed in order to assess the intensity of release of pollutants from the digestate that could be potentially released to land and groundwater in case of industrial application.

The DRI results indicated that most of the easily degradable organic matter from potato waste was consumed in the process of anaerobic digestion where the digestate was normally stable with minimum biological activity. The leachate characterisation showed that pollutants were hardly released from the treated sample. The results reveal that it is possible to use digestate as a soil conditioner to enrich the soil even without dehydration.

However, if digestate is to be used as land fertilizer in agriculture accumulation of pollutants, especially phytotoxic volatile fatty acids, in the upper soil layers would be the limiting factor. In this case, dehydration and compositing would be necessary pre-treatment steps. Relatively low C:N ratio in inlet substrate requires application of co-composting with carbon rich supstrate to increase the observed ratio of 15:1 to recommended values of 30:1.

Keywords: Potato waste, anaerobic, digestate, Dynamic Respiration Index, fertilizer.

KARST CAVE HABITATS IN BOSNIA AND HERZEGOVINA: PRESSURES AND PROTECTION

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Abstract:

Nearly 60% of the territory of Bosnia and Herzegovina is situated in limestone rocks building typically landscape with underground water flow and diverse karst phenomena. Speleological cadastre of Bosnia and Herzegovina records over than 4000 speleological objects with the densest distribution in the Southern and South-eastern Herzegovina, Western and North-western Herzegovina and Central Bosnia. Most of these caves are inhabited by several endemic, rare, endangered and protected cave-dweller animals. Generally, cavernicolous fauna of Bosnia and Herzegovina are considered to be among the most diverse in Europe, being especially important in terms of global biodiversity due to its high level of endemism and relicts. One of the most endangered species is the only stygobitic bivalve in the world, a tertiary relict, Congeria kusceri Bole 1962, endemic to Dinarides, recently recognised as three species, of which Bosnia and Herzegovina is inhabited by two of them: C. kusceri in South/Southeast Herzegovina and C. mulaomerovici Morton & Bilandžija, 2013, in North-western Bosnia (Suvaja).

Amphibious karst cave habitats with permanent or occasional thin layer of water that flow through the parent rocks are frequent in the caves of Bosnia and Herzegovina. These types of habitats are recognised as hygropetric and firstly described in Bosnia and Herzegovina, with characteristic species: Hadesia vasiceki Muller 1911, Nauticiella stygivaga Moravec & Mlejnek, 2002, Typhlogammarus mrazeki Schäferna 1906 and snails of the genus Vitrea as well as a community of marifugical layers. Also, several specific terrestrial subterranean habitats are present on the territory of Bosnia and Herzegovina: at the higher altitude of Bosnian mountain ranges there are numerous ice and snow caves which inhabit a characteristic troglobitic genera and species. In the area of bare karst are particularly pronounced interstitial terrestrial habitats: MSS (Milieu Souterrain Superficiel) and, at the deeper zone, a habitat in rock cracks.

Cave habitats are endangered primarily due to various anthropogenic influences. Therefore, the future biospeleological research in Bosnia and Herzegovina should contribute to proposing new directives for cave and karst conservation and sensitizing the public for the importance and vulnerability of caves in environmental protection.

Keywords: Cave habitats, Dinarides, Bosnia and Herzegovina, conservation, protection.

EVALUATION OF WATER QUALITY OF MILJACKA RIVER USING PHYSICAL AND CHEMICAL PARAMETERS

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Abstract:

The worldwide deterioration of surface water quality has become a growing threat to human society and natural ecosystems hence the need to better understand the spatial and temporal variabilities of pollutants within aquatic systems. The aim of this study is to evaluate importance of physical and chemical parameters in categorisation of ecological status of the Miljacka River.

Based on the results of analysis of 12 physical and chemical parameters measured at three sampling sites (July 2014) and their comparison with the values defined by the Regulation on Hazardous and Harmful Substances in Water (Federation of Bosnia and Herzegovina Official Gazette No. 43/2007) and the Guidelines of the International Commission for the Protection of Danube River – ICPDR, Table 3. Water Quality Classification used for TNMN purposes, for water flows II class, it is evident that some of the parameters significantly exceed the maximum permissible concentration (MPC).

Keywords: Physical parameters, chemical parameters, water quality, Miljacka river.

ASSESSMENT OF POPULATION DISTRIBUTION OF KNAUTIA SPECIES IN SARAJEVOS' REGION USING GIS AND REMOTE SENSING APPLICATIONS

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Abstract:

GIS and remote sensing have been a novel in attempt to fill the voids in the literature data for many species in Bosnia and Herzegovina. Even though the war is over, and 20 years have passed, the country is still recovering, and large portion of the territory is still covered in minefields. Novel software as GIS and remote sensing applications give us new tools and investigation possibilities for those areas that are not accessible. The prime objective of this paper is to provide assessment of possible population distribution patterns of Knautia species in Sarajevo region. In terms of primary goal the paper draws data from literature which is than analysed with descriptive statistics, GIS techniques and remote sensing. The second part of the study is focused on field investigation for assessment of remote sensing accuracy in the field.

Keywords: GIS, remote sensing, population assessment, Knautia.

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ISBN: 978-605-66262-3-4