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A Comparative Study of Physico-Chemical Investigation along Parangipettai and Cuddalore Coast

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The present study was attempted on the physico chemical variability of two different environs along Parangipettai and Cuddalore coastal and estuarine waters of the Bay of Bengal. Comparative study was carried out to examine the level of contaminants affecting the coastal and estuarine environment namely Nitrite, Inorganic phosphate, Ammonia and other physico-chemical parameters. Distribution of nutrients has exhibited considerable seasonal and spatial variations. Station 3 and 4 (Cuddalore coast and Uppanar Estuary) registered higher concentration of nutrients than station 1 and 2 (Vellar estuary and Parangipettai coast). *(Journal of Environmental Science and Technology 1 (1): 1-10, 2008* ***doi:*** *10.3923/jest.2008.1.10)*

Ammonium Ion Removal from Wastewater by a Natural Resin

H. Moazed

A natural resin, Clinoptilolite, in the powder form was used in this study to remove ammonium ions from synthetic wastewaters. The concentrations of the ammonium ion (NH_4^+) in the synthetic wastewaters were 5, 10, 20, 30 and 40 mg L^{-1}. Based on the batch kinetic experiments, the equilibrium time was determined to be one hour for synthetic wastewaters of 5, 10, 20 and 30 mg L^{-1} and 2 h for 40 mg L^{-1} ammonium ion concentrations. Batch adsorption studies were conducted using 40 mg L^{-1} ammonium ion solution and 1, 3, 5, 7 and 10 mg Clinoptilolite per 100 mL wastewater at room temperature. The experiments were conducted up to equilibrium time. The removal efficiencies obtained ranged from 68 to 92%, depending on the mass of Clinoptilolite used. Batch adsorption studies also indicated that the most applicable model for the sorption of ammonium ions from the synthetic wastewater with 40 mg L^{-1} ammonium ion concentration was the Freundlich isotherm model. Results of the study showed that powdered Clinoptilolite could be used in the removal of ammonium ions from synthetic wastewaters with high removal efficiency. *(Journal of Environmental Science and Technology 1 (1): 11-18, 2008* ***doi:*** *10.3923/jest.2008.11.18)*

Profile of Heavy Metals from Automobile Workshops in Akure, Nigeria

Oguntimehin Ilemobayo and Ipinmoroti Kolade

Soil samples from five automobile workshops in Akure, Nigeria were analysed for heavy metals and pH. The samples taken at depths 0-15, 15- 30, 30- 45 and 45-60 cm were analyzed for Ba, Ni, Cr, Pb, Cu, Fe, Cd, Co and Zn metals. pH of soils ranged between 5.80 and 8.60. Cd was not detected in soil samples from all sites, Co was not detected in soils from Ilesha-garage. Fe and Zn were of high concentrations in all the sites considered; Cu and Cr had concentrations about 100 mg kg^{-1} in all sites. Ba, Cu, Zn and Fe were in high concentrations of 133.1, 151.4, 782.2 and 634.3 mg kg^{-1}, respectively at Ilesha-garage. Pb and Cr, have concentrations of 292.4 and 181.8 at Ijapo, respectively, while Ni and Co have 62.1 and 109.4 mg kg^{-1} at Oyemekun, respectively. Generally, many variations exist in concentrations within sites at different depths. However, applying an adopted C/P index value for determining total heavy metal pollution status within the depths and between the sites, the degree of heavy metal pollution was in the order: Ijapo > Ilesha garage > Ondo road > Oyemekun > Oke-ijebu. *(Journal of Environmental Science and Technology 1 (1): 19-26, 2008* ***doi:*** *10.3923/jest.2008.19.26)*

Antibiogram of Bacterial Flora of *Tilapia zilli* from Creeks Around Port Harcourt, Nigeria

D.N. Ogbonna, T.G. Sokari and G.E. Amaku

The gills and intestines of *Tilapia zilli* collected from 4 different creeks around Port Harcourt, Nigeria were examined over a 7 month period for their bacterial flora. A total of 208 *Pseudomonas* sp., 129 *Aeromonas* sp., 90 *Klebsiella* sp. and 50 *Escherichia coli* were isolated and tested for their susceptibility to 10 commonly used antibiotics. Tests on 517 of the isolates showed that all of the *Pseudomonas* sp. were resistant to at least one of the antibiotics. The microflora of the fishes could only have been derived from their environment, i.e., water. The antibiotic susceptibility pattern of the isolates in the present study was compared with the susceptibility pattern of isolates from previous studies. *(Journal of Environmental Science and Technology 1 (1): 27-33, 2008* ***doi:*** *10.3923/jest.2008.27.33)*

Metals Concentrations in the Sediments of Richard Lake, Sudbury, Canada and Sediment Toxicity in an Amphipod *Hyalella azteca*

M. Shuhaimi-Othman

Surface sediment from 9 different water depths at 1 m depth intervals (1 to 9 m) in Richard Lake, Sudbury, Canada was sampled in August 1998 and analyzed for 10 metals including copper (Cu), zinc (Zn), cadmium (Cd), nickel (Ni), lead (Pb), cobalt (Co), molibidenum (Mo), vanadium (V), barium (Ba) and titanium (Ti). Metal analysis showed that surface sediment at the depth of 3 m depth has the highest concentrations of metals especially of Ni (4721.1±821.6 μg g^{-1}) and Cu (1011.0±46.4 μg g^{-1}). The results of a toxicity study in the laboratory which showed that surface sediment from a depth of 3 m was the most toxic to *H. azteca* (LT50 129.12 h) and had the highest metal concentrations (especially Ni and Cu) in overlying water and in amphipod tissues. *(Journal of Environmental Science and Technology 1 (1): 34-41, 2008* ***doi:*** *10.3923/jest.2008.34.41)*

Horse Hair as an Indicator of Pb Pollution Around Shiraz Oil Industry, Iran

Mehrdad Pourjafar, Khalil Badiei and Mostafa Shakhse-Niaie

The objective of the current study was to assess the potential for using the horse hair as a bio-indicator of environmental pollution. Horse hair samples from different radial distances from oil and petrochemical industries of Shiraz were analyzed to determine their Pb content. Viz farms located in radial zone of 1-1.5, 1.5-5, 5-7, 7-10 km, respectively considered as group A, B, C and D. Group E (control farms) were far from exam place and roads. In order to sampling, each farm was visited at every season and from 19 selected horses approximately 2 g cervical skin hair was collected. The lead content of samples was measured by Atomic Absorption spectrometer. The horses which were located closer to oil industry had higher hair Pb content. In all seasons except for winter significant differences existed between group A and all other groups ($p<0.05$). Also by respect of going from spring to winter we can see decline in lead burden in all groups. In this study, hair Pollution Factor (PF) of lead, 1-3.95 may reflect the higher effect of environmental pollution and anthropogenic interference. The results showed increases Pb concentration in the hairs of the horses according to decrease of distance to oil industry, therefore Pb as determined in the hair of the animals, showed a certain potential for using horses as bio-indicators of environmental pollution. *(Journal of Environmental Science and Technology 1 (1): 42-46, 2008* ***doi:*** *10.3923/jest.2008.42.46)*

The Effect of Cement Dust Pollution on Celosia Argentea (Lagos Spinach) Plant

O.E. Ade-Ademilua and D.A. Obalola

The effect of cement dust pollution on heavy metal uptake, growth, chlorophyll content, vitamin content and metal accumulation of *Celosia argentea* (Lagos spinach) was investigated. Loamy soil polluted with Portland cement (100:1) had significant amount of iron, calcium, magnesium, aluminium, silicon and sulphur (in form of sulphates) which are prominent in cement dust. Zinc and copper levels in the polluted soil though not present in cement dust, were also significantly higher in concentration in the polluted soil. The presence of cement in the polluted soil did not affect the germination time of *C. argentea* seeds. Upon growing, the spinach plants were polluted with 10.2 g m^{-2} cement dust at 3 days interval, between the 40th and 100th days of their growth. The results showed that cement dust had no significant effect on the germination of seeds of *C. argentea*. There was a significant reduction in shoot length and total leaf area of polluted plants. The dry weight of the polluted plants was significantly lower throughout the period of analysis than those of the control plants. The frequency and size of the epidermal cells and stomata of the polluted leaves were greatly modified. The level of vitamin A was reduced by 62%, vitamin B_2 by 55% and vitamin C by 24%. Though the iron and calcium concentrations of the polluted plants were raised by 78 and 26%, respectively, there was a significant accumulation (at $p = 0.05$) of heavy metals such as aluminium (Al), copper (Cu) and zinc (Zn) in the polluted plants. These results may discourage the practice of vegetable gardening in areas under cement dust pollution. *(Journal of Environmental Science and Technology 1 (2): 47-55, 2008* ***doi:*** *10.3923/jest.2008.47.55)*

An Assessment of the Impact of Abattoir Effluents on River Illo, Ota, Nigeria

D.O. Omole and E.O. Longe

The aim of this research was to assess the impact of abattoir effluents on River Illo in Ota, Nigeria. In order to achieve this set objective seven sampling locations were chosen along the river course. The choice of locations was to reflect the variations in concentrations of the following important parameters of water quality issue: pH, conductivity, total dissolved solids, total suspended solids, dissolved oxygen, biochemical oxygen demand, chemical oxygen demand, ammonia and nitrate among others. The choice of these parameters was based on their relative

importance in abattoir effluents composition. Results of analyses revealed impairment in the quality of River Illo by the wash down from the abattoir activities. Dissolved oxygen concentrations ranged between 0.01 and 4.6 mg L^{-1} while the highest concentrations of TSS and TS of 1026 and 1071.5 mg L^{-1}, respectively were obtained at the point of abattoir effluents discharge. The BOD mean value of 312.9 mg L^{-1} obtained for the river water is far above the highest permissible value of 30 mg L^{-1} allowed by the Federal Environmental Protection Agency for discharge into receiving water bodies in Nigeria. The mean value of 783 mg L^{-1} obtained for the COD of the river body corroborates the pollution of the water body. The current water quality status of River Illo from the discharge of abattoir effluents therefore poses both environmental and health hazards to users. In order to redress this and ensure public health safety, River Illo needs adequate treatment before use. *(Journal of Environmental Science and Technology 1 (2): 56-64, 2008* ***doi:*** *10.3923/jest.2008.56.64)*

Irrigation-Induced Infiltration and Recharge: Implication for Groundwater Quality

Moshood N. Tijani and Ally A. Agakwu

This study focuses on the quality impact assessment of irrigation-induced infiltration and recharge under amended agricultural fields on shallow groundwater systems using experimental pilot green-house set-up. The results show that irrigation leachate analyses under Waste-Dump Soils (WDS), Organomineral and NPK-amended soil substrates planted with a common edible vegetable crop (*Amarantus* species) exhibited 1.6 to 52.4 fold enrichment of Cu, Zn, Co and Ni under both Waste Water Irrigation (WWI) and Fresh Water Irrigation (FWI). However, the observed depletion of Pb, Cd and Cr can be attributed to possible uptake by the vegetable crop and enrichment in the residual soil as reflected by the estimated Enrichment Factor (EF) of >1.0. Despite depletion in the originally amended soils, the enrichment of Cd, Cr, Co and Ni in the NPK and organo-amended residual soils and irrigation leachates under WWI and FWI, points to the negative impact of wastewater irrigation and irrigation-induced leaching/mobilization of trace metals even at low concentrations. Also, the residual soils (after harvesting) when compared to the un-amended virgin soils exhibited positive enrichment with respect to Cu, Pb and Cd. However, only residual WDS exhibited enrichment with respect to Cr, Co and Ni, while the depletions in the other substrates (Orago and NPK-amended) imply that the organo and NPK-amendment do enhance enrichment of these metals in the residual soils. Nonetheless, the overall assessment shows a higher solubility and mobility of

potential toxic trace metals in leachates from NPK-amended soils with leachate EF of 30.4 to 64.0 compared to (EF of 2.1-9.2 for organominerals-amended soils and EF of 6.4-8.9 for waste dump soils under both WWI and FWI. Furthermore, the observed enrichment in the residual soils imply potential sources of trace metal contaminations through leaching, long after harvest, with attendant negative impacts on the shallow groundwater quality. *(Journal of Environmental Science and Technology 1 (2): 65-72, 2008* ***doi:*** *10.3923/jest.2008.65.72)*

Monitoring of Forest Cover Change in Pranahita Wildlife Sanctuary, Andhra Pradesh, India Using Remote Sensing and GIS

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The present study assess spatial change in the land cover over the last decade in Pranahita Wildlife Sanctuary, Adilabad district, Andhra Pradesh, India using Landsat TM and IRS P6 LISS III images. From 1993 to 2004, the forest cover had a severe change and lost about 248.87 ha. There was increase in the scrub cover to about 1637.17 ha, which was quantified to be 172.77 ha. Over all change analysis from 1993 to 2004 with reference to forest cover indicates, negative changes (loss of forest area) accounted for 1229.02 ha (9.04%) area and positive changes (gain of forest) for an area of 980.14 ha (9.04%). The results of the change detection using multi-date satellite imagery suggest that the most of the forest cover has been clearly degrading over the years. The study concluded that underlying causes for the forest cover change are multifarious including illegal logging, grazing, forest fire, expansion of agricultural lands and invasion of exotic species. *(Journal of Environmental Science and Technology 1 (2): 73-79, 2008* ***doi:*** *10.3923/jest.2008.73.79)*

Ochratoxin A Burdens in Rice from Lagos Markets, Nigeria

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Twenty five different brands of rice from Lagos markets in Nigeria were sampled and assessed for Ochratoxin A (OTA) contamination using High Performance Liquid Chromatography (HPLC). Samples were homogenized by grinding and extracted with 12.5 mL of 0.1 M phosphoric acid and 125 mL of methylene chloride. The extracts were cleaned-up with a syringe packed with acid washed Celite 545 column fitted to a solid phase extraction vacuum manifold and the analyte was eluted with methylene chloride/formic acid. The extract was

pre-concentrated prior to HPLC analysis. Result indicated that OTA level in pic rice was non-detectable. Twenty four of the twenty five brands of rice analyzed contained trace levels of OTA, the content of which ranged from 0.01 ng g^{-1} in miss lily parboiled rice to maximum concentration of 2.18 ng g^{-1} in rice king. The mean concentration was 0.34 ng g^{-1}. The low level of contamination evident from the study suggested that consumption of rice available in Lagos markets was relatively safe. Results indicated that the levels of OTA in the rice samples were within acceptable limits. Recovery of Ochratoxin A in selected samples on spiking ranged from 84.6-92.5%, the mean recovery being 89.8%. *(Journal of Environmental Science and Technology 1 (2): 80-84, 2008* ***doi:*** *10.3923/jest.2008.80.84)*

Indoor Aeromycological Study in Manisa, Turkey

Fatih Kalyoncu

In this study, a systematical survey on the indoor airborne fungi was carried out for one year in Manisa. Fungal samples were collected in each month with Merck MAS100 air sampler from four sampling sites. Fungal concentrations were reported as colony forming units per cubic meter of air using the MAS100 conversion unit table. Results showed that the average fungal concentration is 320 colony forming units cfu m^{-3}. Twenty one species belonging to 7 genera were identified according to their microscopic, macromorphological properties and through references. *Penicillium*, with the most abundant genera, which comprised more than 38 of the total isolated fungal species. *Cladosporium* were the most dominant fungal group, followed by *Penicillium*, *Aspergillus* and *Alternaria*. *(Journal of Environmental Science and Technology 1 (2): 85-89, 2008* ***doi:*** *10.3923/jest.2008.85.89)*

Comparison of DAX-8 and DEAE for Isolation of Humic Substances from Surface Water

M.B.M. Ibrahim, A.S. Moursy, A.H. Bedair and E.K. Radwan

Aquatic humic solutes were isolated in parallel by the non-ionic macroporous DAX-8 and diethylaminoethyl cellulose (DEAE-cellulose) resins from Nile river. Non-humic substances and humic substances which were separated from the water samples were determined. In addition, humic and fulvic acids were also determined. Quantitative measurement of aquatic humic substances was carried out by Total Organic Carbon Analyzer (TOC). Generally, concentrations of the Non-humic substances were greater than the humic substances in water samples.

The fulvic acid concentration of the water samples examined ranged between 1.36 and 4.67 mg C L^{-1}, while the level of humic acid ranged between 0.72 and 3.04 mg C L^{-1}. DEAE-cellulose gives a useful conventional sorbing solid in the isolation of the bulk of aquatic humic substances over DAX-8. (Journal of Environmental Science and Technology 1 (2): 90-96, 2008 ***doi:*** *10.3923/jest.2008.90.96)*

Tracing Trends in the Sequences of Dry and Wet Days over Peninsular Malaysia

Sayang Mohd Deni, Suhaila Jamaludin, Wan Zawiah Wan Zin and Abdul Aziz Jemain

This study attempts to trace changes in the dry and wet spells over Peninsular Malaysia based on the daily rainfall data from twenty rainfall stations which include four sub-regions, namely; northwest, west, south and east for the period of 1975 to 2004. Nine indices for each dry and wet spells comprising of the main characteristics for each spell, the persistency and the frequency of the various length of dry (wet) spells will be used to identify whether or not these indices have increased over Peninsular Malaysia. The Mann-Kendall (MK) trend test indicate that as the persistency of wet days is increased, the trend of the frequency of long wet spells is also found to be increased in most stations over the peninsula; however, decreasing trend is observed in the frequency of short spells in these stations. The frequency of long dry periods tends to be higher with a significant increase in the mean and variability of the length of the dry spells over the southern areas; whereas, all the indices of wet spells in these areas show a decreasing trend. Furthermore, over the western areas, all the indices of dry spells exhibit a negative trend and at the same time, the frequency of short wet spells exhibits a negative trend with an increase in the mean, variability and the persistency of the wet spells. Generally, no significant trend is found in most of the indices of dry (wet) spells in most stations over the northwestern and eastern areas for the period of 1975 to 2004. *(Journal of Environmental Science and Technology 1 (3): 97-110, 2008* ***doi:*** *10.3923/jest.2008.97.110)*

Removal of Selected Organic Compounds in Aqueous Solutions by Activated Carbon

S. Göktürk and S. Kaluç

The adsorption behaviour of Safranin-O (a cationic dye), phenol and nitrophenols i.e., *m*-nitrophenol, *p*-nitrophenol and *o*-nitrophenol was studied from aqueous

solution on activated carbon under various experimental conditions. It was found that the Langmuir isotherm appears to fit the isotherm data better than the Freundlich isotherm. Dubinin-Raduskevitch (DR) isotherm was successfully used to model experimental data and modeling results showed that the uptake Safranin-O and phenols proceeded by physical adsorption. The adsorption capacity of activated carbon obtained from both Langmuir and D-R models for phenol and nitrophenols were found to be higher than for Safranin-O and following the order as: *m*-nitrophenol > *o*-nitrophenol > *p*-nitrophenol > phenol > Safranin-O. The kinetics of adsorption in view of three kinetic models, i.e., the first-order Lagergren model, the pseudo-second-order model and the intraparticle diffusion model was discussed. The pseudo-second-order kinetic model describes the adsorption both Safranin-O and phenols very well. The effect of temperature was also studied at the range between 293 and 323 K. Thermodynamic studies indicated that the adsorption both of Safranin-O and phenols onto activated carbon was an exothermic process. The negative values of free energy determined for these systems indicated that adsorption was spontaneous at the temperatures under investigation. *(Journal of Environmental Science and Technology 1 (3): 111-123, 2008* ***doi:*** *10.3923/jest.2008.111.123)*

Adsorption Characteristics of Active Carbons from Pyrolysis of Bagasse, Sorghum and Millet Straws in Ortho Phosphoric Acid

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Pyrolysis of bagasse, sorghum and millet straws impregnated with ortho phosphoric acid, produced carbon with heterogeneous pore structure and high adsorption capacities. Carbon precursors with particle size of 1180 μm were pyrolysed, to overcome difficulties caused by low density and high ash content. The active carbons obtained from low impregnation ratios (<13.6) were largely microporous. Higher impregnation ratio did not substantially benefit the evolution of micropores in the pyrolysed samples. Fast attainment of sorption equilibrium was skewed towards high initial concentrations of methylene blue. The impregnation ration, controlled by varying the proportion of H_3PO_4, had strong influence on the yield of carbon. Equilibrium yields were highest at 450°C, with impregnation ratio of 13.6. Production of active carbons was completed in 45 min. The adsorptive capacities of the active carbons for large molecular weight compounds such as methylene blue were 502, 662 and 390 mg g^{-1} for bagasse, sorghum and millet straws, respectively. The iodine numbers which indicate the adsorptive capacities for low molecular weight substances were 626, 667 and 593 mg g^{-1} for bagasse, sorghum and millet straws, respectively. These iodine

numbers are more than 18% higher than the value recommended for low molecular weight compounds by American Water Works Association. *(Journal of Environmental Science and Technology 1 (3): 124-134, 2008* ***doi:*** *10.3923/jest.2008.124.134)*

Impact of Municipal and Industrial Waste on the Distribution and Accumulation of Some Heavy Metals in Sandy Soils of Al-Qassim Region at Central of Saudi Arabia

Saud S. AL-Oud

An experiment was conducted to study the distribution and accumulation of Pb, Ni, Co, Cu, Zn, Mn and Fe throughout sandy soils treated with industrial wastes. Surface and subsurface soil samples were collected from three sites namely; Aldahy, Almota and Alsenayh, which representing the major agricultural soils of Qassim, central region of Saudi Arabia. These sites have been used for dumping domestic and industrial wastes for more than 20 years to evaporate and infiltrate solid and liquid industrial waste. The obtained results indicated that, the application of industrial wastes resulted in a marked increase in the total amount of studied metals. Maximum concentrations of metals were found in the surface 30 cm of the soil where Fe > Mn > Zn > Ni > Pb > Cu > Co in most cases. Most movement and amount of metals recovered from soil were predominantly limited to the upper 30 cm depth. The DTPA fraction of metals was relatively small comparing either to the total soil content and/or the 0.5 N HNO_3extractable fractions. For example, the average DTPA extractable Pb was highest (3.37 μg g^{-1}) in Almota soils, 2.41 μg g^{-1} Aldahy soil and 1.08 μg g^{-1} in Alsenayh soil. The respective Pb values extracted by 0.5 N HNO_3 for the three sites were 6.75, 5.37 and 4.49 μg g^{-1}. Total Pb values were 23.23, 21.77 and 17.63 μg g^{-1}, respectively. All the three forms were highest in Almota area and lowest in Alsenayh area. The average Ni content of the three soils was more or less in the same range as Pb. However, total Ni values were 2 to 3 times higher in Alsenayh soils. Though, these values were still low as compared to the contaminated reported levels but it indicated that these have been contaminated with the dumping of industrial waste. The values of Co for DTPA, HNO_3 and total extracts were relatively low when compared to Pb and Ni. Average DTPA content was 0.65 μg g^{-1} for Alsenayh while it was 0.64 μg g^{-1} for Aldahy and 2.02 μg g^{-1} for Almota soils. The data shows a high accumulation of these metals in contaminated area. Accumulation rate was highest for Ni, Cu, Co, Pb followed by Fe, Zn and Mn. *(Journal of Environmental Science and Technology 1 (3): 135-142, 2008* ***doi:*** *10.3923/jest.2008.135.142)*

Biosorption of Crystal Violet from Water on Leaf Biomass of *Calotropis procera*

Hazrat Ali and Shah Khalid Muhammad

The biosorption of a triphenylmethane dye, crystal violet from water on leaf biomass of *Calotropis procera*, a member of the family Asclepiadaceae, was studied. The effect of contact time, initial dye concentration and adsorbent dose were investigated. The biomass showed good removal efficiency for crystal violet from water. The adsorbent removed 80.48% of crystal violet from aqueous solution at a dye concentration of 20 mg L^{-1} (about 50 μM) in 60 min. The adsorption data fitted well into Langmuir adsorption isotherm showing monolayer coverage of the adsorbent surface. The Langmuir parameters, q_o and K_L were calculated to be 4.14 mg g^{-1} and 0.1139 L mg^{-1}, respectively. The kinetic data showed that the biosorption of crystal violet on the biomass obeys Lagergren first order rate expression. The rate of biosorption was rapid in the initial 5 min and then decreased gradually and attained equilibrium in 60 min. The rate constant came out to be 0.0322 min^{-1}. *(Journal of Environmental Science and Technology 1 (3): 143-150, 2008* ***doi:*** *10.3923/jest.2008.143.150)*

Removal of Cu (II), Ni (II) and Cr (III) Ions from Wastewater Using Complexation-Ultrafiltration Technique

M.A. Barakat

In the recent years, the complexation-ultrafiltration technique has been shown to be a promising technique for removal of heavy metals in solution. In this study, a polymer-enhanced ultrafiltration process has been investigated for removal of toxic heavy metals such as Cu (II), Ni (II) and Cr (III) from synthetic wastewater solutions. Carboxy methyl cellulose as a water-soluble polymer was used for complexing the cationic forms of the heavy metals before filtration. The functions of the metal-CMC complexation are to increase their molecular weight and their size. The size of the complex has to be larger than the pores of the selected membrane so the complex can be retained. Permeate water is then purified from the heavy metals. Filtration experiments were performed with ultrafiltration membrane system, equipped with a polyethersulfon membrane with a 10000 Daltons cut-off. The pressure was fixed at 1 bar with a permeate flow rate of 7.5 L hG[1]. Different parameters, affecting the percentage rejection of the metals, such as pH and metal/CMC ratio have been investigated. Results obtained revealed that the maximum percentage of the metals rejection was achieved at pH$7 with increasing of the CMC concentration. Advantages of that technology

over the other conventional technologies are the low energy requirements involved in ultrafiltration, the very fast reaction kinetics and the high selectivity of separation. *(Journal of Environmental Science and Technology 1 (3): 151-156, 2008* ***doi:*** *10.3923/jest.2008.151.156)*

Utilization of Wood Vinegars as Sustainable Coagulating and Antifungal Agents in the Production of Natural Rubber Sheets

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The coagulating and antifungal properties of *Eucalyptus globulus* wood vinegars (raw and tar-extracted types) in the production process of *Hevea brasiliensis* Natural Rubber (NR) sheets were investigated and compared with those of formic and acetic acids. It was found that plasticity retention index, Mooney viscosity, curing times (t_{90}) and mechanical properties of NR coagulated by wood vinegars were similar to those using acetic acid and better than using formic acid. The antifungal efficiency of wood vinegars, acetic acid and formic acid was determined from a fungi growth area on NR sheet surfaces. The antifungal efficiency of the coagulants was found in the following order: raw wood vinegar > tar-extracted wood vinegar > acetic acid > formic acid. The antifungal efficiency of the wood vinegars was confirmed through the inhibitory growth of the main fungus, *Penicillium griseofulvum*, on potato dextrose agar. *(Journal of Environmental Science and Technology 1 (4): 157-163, 2008* ***doi:*** *10.3923/jest.2008.157.163)*

Environmental Noise Pollution in the City of Khoramabad, Iran

Seyed Hamed Mirhossaini, Ghodratollah Shams Khoramabadi, Ali Jafari and Saeed Dehestani

This study was carried out to assess the environmental noise pollution in the city of Khoramabad, Iran. On the basis of the resultant acoustic zoning 30 sites were selected for an experimental study. The main indices for noise pollution (Leq, L_1, L_{10}, L_{50} and L_{90}) were measured. Results indicated that main streets of Khoramabad are overloaded during day-time. In all the sites average daily sound levels was 14 dB higher than environmental standards due to street traffic and peculiar geo-morphological structure of the town. *(Journal of Environmental Science and Technology 1 (4): 164-168, 2008* ***doi:*** *10.3923/jest.2008.164.168)*

Adsorption Behavior of *p*-chlorophenol on the Reed Wetland Soils

Ding Cheng, Li Zhaoxia, Yan Jinlong and Jin Jianxiang

Investigation of the adsorption behavior of organic pollutants by soils is fundamental to simulating and eventually predicting their transport in environmental compartments. The adsorption behavior of *p*-chlorophenol by soils from Yancheng reed wetland was studied in a series of batch equilibration experiments and experiments were analyzed by Langmuir and Freundlich isotherm equation. Results showed that the adsorption process could be described with both Freundlich and Langmuir isotherms. But the empirical Freundlich equation fit the behavior better and the highest correlation coefficient, r = 0.9690, was obtained. Parameters affected the adsorption property of *p*-chlorophenol, such as solution pH, ionic strength and soil organic matter, were also studied. Adsorption capacity increased with lower pH, higher ionic strength and soil OC. *(Journal of Environmental Science and Technology 1 (4): 169-174, 2008* ***doi:*** *10.3923/jest.2008.169.174)*

The Occurrence of Soil Water Repellency Under Different Vegetation and Land Uses in Central Iran

A.A. Zolfaghari and M.A. Hajabbasi

The aim of present study was to test water repellency in some arid Iranian soils and to investigate the effect of change in land-use, on water repellent soils. The persistence of soil water repellency was measured on field-moist and dried soil samples by using the Water Drop Penetration Time (WDPT) test in forest, unaltered pastures and cultivated lands of semi-arid regions. Water repellency was observed in forest, but was not observed in pasture and cultivated lands. Water repellency was not found in soil samples containing less than 4.1% organic matter. By increasing soil organic matter, soil water repellency intensity increased, too. Water drop penetration time in samples under the trees was higher than far from trees. Samples with more than 4.3% organic matter were slightly water repellent and samples with more than 4.6% organic matter were strongly water repellent. Generally, in the study area a severely water repellent soil was not found. *(Journal of Environmental Science and Technology 1 (4): 175-180, 2008* ***doi:*** *10.3923/jest.2008.175.180)*

Estimation of Evapotranspiration Using Fuzzy Systems and Comparison With the Blaney-Criddle Method

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In this research, the possibility of predicting potential evapotranspiration using fuzzy logic theory with temperature as input is studied. The fuzzy logic model is being trained using a series of temperature and evapotranspiration values. The results are being compared to measured values and with the ones obtained using the Blaney-Criddle method. The results show a high efficiency in calculating and predicting the potential evapotranspiration values. *(Journal of Environmental Science and Technology 1 (4): 181-186, 2008* ***doi:*** *10.3923/jest.2008.181.186)*

Effects of Arranging Forest Fuel Reduction Treatments in Spatial Patterns on Hypothetical, Simulated, Human-Caused Wildfires

Young-Hwan Kim and Pete Bettinger

In this research, we simulated wildfires that originated from hypothetical human-caused ignition points to determine whether a broad-scale schedule of fuel reduction treatments would be effective in reducing wildfire size or severity. The study area was a large watershed in Northeastern Oregon (USA). The fuel reduction treatments included commercial thinning and thinning followed by a prescribed fire treatment. These fuel reduction treatments were distributed across the landscape in such a way as to simultaneously maximize both an even-flow of timber harvest volume and a spatial pattern of activity (dispersed, clumped, random and regular). We found that the clumped and regular patterns of management activity seemed to reduce simulated wildfire severity most effectively in two out of three cases. A dispersed pattern of management activity required scheduling more area for treatment since treatments spaced as far apart as possible produced lower scheduled timber volumes, thus had no recognizable effect. A random pattern of fuel reduction activities also seemed to have no effect on characteristics of simulated human-caused wildfires. *(Journal of Environmental Science and Technology 1 (4): 187-200, 2008* ***doi:*** *10.3923/jest.2008.187.200)*

Biosorption of Lead (II) Ions From Aqueous Solutions by Biological Activated Dates Stems

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In this research, we investigated a biological activation method of dates stems, an abundant agricultural wast by-Product in Algeria, to improve there biosorption capacity for lead (II) ions. Batch experiments were carried out to determine Pb^{2+} sorption capacity and the efficiency of the sorption process under different pH, contact time, initial Pb^{2+}, dates stems concentrations and temperature. The biosorption capacity was found to increase in the five parameters studied. The biosorption for Pb^{2+}onto activated dates stems obeys to the Langmuir and Freundlich isotherms models. Three kinetic models are the pseudo-first-order, pseudo-second-order and intraparticle diffusion model were selected to interpret the biosorption data. Kinetic parameters and related coefficients, for each cognatic were calculated and discussed. It was indicated that the biosorption for Pb^{2+} onto activated dates stems could be described by the pseudo-second-order kinetic. Various thermodynamic parameters such as standard enthalpy ($\Delta H°$), standard entropy ($\Delta S°$) ans standard free energy ($\Delta G°$) were evaluated. *(Journal of Environmental Science and Technology 1 (4): 201-213, 2008* ***doi:*** *10.3923/jest.2008.201.213)*

Fuzzy Model Comparison to Extrapolate Rainfall Data

C. Tzimopoulos, L. Mpallas and C. Evangelides

This research presents two fuzzy rule-based models for extrapolating the missing rainfall data records of a station, utilizing as a reference the values from another meteorological station located in an adjacent area. The first one is constructed based on the least squares algorithm and the second one using ANFIS method. Three stations were used in this research, all located in Northern Greece. The values of Thessaloniki station were used as fuzzy premises and the values of Sindos and Kria Vrisi were used as fuzzy responses. The model performance was measured by testing several types and numbers of membership functions. Both models are compared with the classical method of linear regression. The comparison between the classical and fuzzy logic method, shows that the second one performs better in recovering the missing rainfall values. It was also found that a fuzzy rule based system, trained with the least squares algorithm, with two fully overlapping fuzzy numbers, is identical to the linear regression method. *(Journal of Environmental Science and Technology 1 (4): 214-224, 2008* ***doi:*** *10.3923/jest.2008.214.224)*

Land Use Planning and the Yangtze Ecosystem (Wuhan Section): Implications for Sustainability

D. Chibamba, J. Li and L. Zhang

This study explores the effects of land use planning on the Yangtze ecosystem and suggests a framework for incorporating ecological information into land use planning in order to achieve sustainability. The discussion is based on the insights and experiences from the Wuhan city section of the Yangtze River Basin. In China, unprecedented industrialisation and urbanisation have made the Yangtze one of the world's top 10 rivers at risk, its major threat being pollution. Incidences of pollution are ongoing and in many cases increasing. The momentum of the country's population growth, together with the imperative of further economic development, implies that pollution in the Yangtze will worsen before it gets better. Thus, linking ecological information to the planning process is imperative to achieve sustainable development. *(Journal of Environmental Science and Technology 2 (1): 1-11, 2009* ***doi:*** *10.3923/jest.2009.1.11)*

A Microcosm Study of Endosulfan Degradation and its Short-Term Effect on pH and Biological Parameters of Cotton Zones Soils of Burkina Faso

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We studied under microcosm conditions the degradation of endosulfan and its effect on soil microbial respiration, soil microbial population and pH evolution in three major soil types of Burkina Faso. Results indicated that the recommended treatment dose of endosulfan (3 μg g^{-1}) did not affect soil pH. But when the dose was 6 μg g^{-1}, a stimulation of the respiratory activity of the soils during the first five days and a disturbance of the pH were observed. There were no significant impact of endosulfan at 3 and 6 μg g^{-1} of soil in the total bacterial number. After 5 days of incubation the degradation rate of endosulfan with initial concentration of 3 μg g^{-1} were 50, 56.5 and 83.5% in the soil from Boni, Farakoba and Kaibo, respectively. But when the initial concentration of endosulfan was 6 μg g^{-1}, the figures were 94.6, 79.6 and 20.4%, respectively. Endosulfan degradation in these three soils led to a production of endosulfan-sulphate. *(Journal of Environmental Science and Technology 2 (1): 12-21, 2009* ***doi:*** *10.3923/jest.2009.12.21)*

Water Adsorption and Surface Acidity of Nano-Ball Allophane as Affected by Heat Treatment

Hamayoon Khan, Rozina Khan, Naoto Matsue and Teruo Henmi

Effect of heat treatment on sthe water adsorption and surface acidity of two nano-ball allophane samples with varying Si/Al ratio under different relative humidities (RHs) was studied. The water vapor adsorption of two allophane samples under various relative humidities, decreased with preheating treatment up to 400°C for 2 h. The decrease in water adsorption at monolayer level (RH≤0.45) was greater for KnP sample than for KyP sample, whereas the decrease in water adsorption due to capillary condensation between allophane unit particles (RH≥0.6) was greater for KyP sample. These indicate that allophane hollow spherical particles in KyP sample were directly connected each other with the preheating, but those in KnP sample were not. Heat treatment caused the enhancement in the surface acidity of nano-ball allophane samples. The enhancement in the surface acidity after heat treatment is attributed to the inductive effect on the Si-OH groups present at the pore region of the hollow sphere. The results showed that surface acidity of the allophane with higher Si/Al ratio (KnP) was stronger than the (KyP) sample having lower Si/Al ratio. This trend was observed under RH between 0 and 75%; then the acid strength for the two samples was the same at RH of 98%. After the heat treatment at lower level of RH, the surface acidity of KnP was higher than KyP. The presence of polymerized silicate tails exposed outside of hollow spherical allophane particles (KnP), causes the enhancement of the BrØnsted acidity and also prevent direct connection between the particles after heating. *(Journal of Environmental Science and Technology 2 (1): 22-30, 2009* ***doi:*** *10.3923/jest.2009.22.30)*

TiO_2-MoO_3 as Photocatalyst for Azo and Triphenylmethane Dyes Decolouration

J.B. Tchatchueng, B.B. Loura, J. Atchana and R. Kamga

TiO_2-MoO_3 was first used as catalyst to oxidize propylene to acetone. The by-products of this reaction were acetic acid, acetaldehyde and carbon dioxide. The decolouration performances of TiO_2 and TiO_2-MoO_3 for the oxidation of azobenzene in aqueous suspensions irradiated with UV light at 365 nm were studied at pH 3 and 10. At pH 3 complete decolouration of azobenzene dye was obtained after 30 min of irradiation in the presence of TiO_2-MoO_3 whereas in the presence of TiO_2 the time of complete decolouration was 55 min. Subsequent

study using TiO_2-MoO_3 as photocatalyst was the study of the kinetic rate constants of azo and triphenylmethane dyes decolouration. The results were as followed: 0.4535, 0.6832, 0.8512 and 0.9946 m for methyl green, fast green, crystal violet, malachite green respectively at the same concentration of 0.05 mM. The kinetic rate constants for azo dyes were: azobenzene 0.2909 m (C_0= 0.032 mM), methyl orange 0.5497 min^{-1} (C_0 = 0.04 mM) and p-methyl 0.8168 m (C_0 = 0.1 mM). These results showed that using TiO_2-MoO_3 as photocatalyst the decolouration was rapid and total after irradiation time of 30 min whatever the azo or triphenylmethane dyes. *(Journal of Environmental Science and Technology 2 (1): 31-39, 2009* ***doi:*** *10.3923/jest.2009.31.39)*

Soil Behavior Prediction under Footings Regard to the Elasto-Plastic Models (Shahkarami Model)

J. Khazaie, S.A. Amirshahkarami and M. Goodarzy

Experiences and studies were shown that the modeling of geotechnical material behavior was very difficult by using of mathematical equations. For this reason, the calibration of models and establishment of parameters may be available for some stress-path. Presently all stress-paths are not analyzable by any of behavior models. Therefore in engineering designs, we must be studied a large domain as a model. The stress-path and calibration must be coordination. Models and parameters for small footings had a shearing behavior and for large footing had an isotope compression. In the shearing behavior by increasing the load and deformation after yielding the behavior of soil would be softening but the behavior of soil under the large footing would be hardening. Therefore the behavior of soil under the footing was related to the dimension of footing. In this study, we will consider the different types of analytical models for large and small footing on the hard earth. In this investigation are used the finite element methods by ANSYS software for analyzing. *(Journal of Environmental Science and Technology 2 (1): 40-47, 2009* ***doi:*** *10.3923/jest.2009.40.47)*

Calculation of Concrete Minarets Frequency by Neural Network

A. Ziaie and M.B. Rahnama

Determination of natural angular frequency of concrete minarets by artificial neural network with various supporting conditions is general goal of this research. For the subject of neural network, training or learning algorithms are applied .The most famous of network structure which is back propagation algorithm is applied in this

study. This algorithm is a systematic method for training multi layer artificial neural network. Back propagation algorithm is based on gradient descant which means that it moves downward on the error declination and regulates the weights for the minimum error. In this research, the real frequency of concrete minarets is calculated first using SAP2000 program and is defined as a goal function for neural network, so that all outputs of the network can be compared to this function and the corresponding error can be calculated and so the best function will selected. Then, a set of inputs including dimensions or specifications of arches are made using MATLAB program. After the determination of algorithm and quantification of the network, the phases of training and testing of the results are carried out and the output of the network is created. It is concluded that the performance of the neural network is optimum and the errors are less than 8%, so, the network trains in different manner. Furthermore the time of frequency calculations in neural network is less than real analysis time that calculated by SAP2000 software and its precision is acceptable (less than 12%). *(Journal of Environmental Science and Technology 2 (1): 48-55, 2009* ***doi:*** *10.3923/jest.2009.48.55)*

Pedo-Landscape and Development of *Lippia multiflora* in the Southern Côte D'Ivoire

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A study on geological, geomorpholigical, pedological, hydrological and botanical prospection was undertaken. The main focus was to identify the types of rocks, relief, soils, river and flora which characterize a suitable landscape for the growth of *Lippia multiflora*. The results obtained from this first investigation indicate that *Lippia multiflora* needs a savannah type environmental ecosystem with sandy soils derived from silico-aluminous rocks preferably developed in medium or base of hill topographical positions. *(Journal of Environmental Science and Technology 2 (1): 56-62, 2009* ***doi:*** *10.3923/jest.2009.56.62)*

Analysis the Plant Nutrients and Organic Matter in Textile Sludge in Gazipur, Bangladesh

M.M. Islam, M.A. Halim, M. Saiful Islam, M. Safiqul Islam and C.K. Biswas

The present research was carried out to determine the content of essential macro nutrients (N, P, K and S) as well as Fe, total organic carbon and total organic matter in textile sludge of Apex Weaving and Finishing Mills Ltd., Gazipur,

Bangladesh and assess its possibility to use as a soil conditioner or fertilizer in agricultural land. The results revealed that plant macro nutrients Nitrogen (N), Phosphorous (P), Potassium (K) and Sulphur (S) were found in significant amount compared to some commonly used organic manures. The range of various macro nutrients was 1.53-2.37, 0.09-0.14, 0.11-0.17 and 2.69-3.42% for N, P, K and S, respectively. The concentration of iron (19.52%) was also very high in the sludge than that of in soil. Moreover; total organic carbon (19.89%) and total organic matter (34.67%) were abundantly available in sludge. In addition, thermal study explores that after 400°C the sludge was thermally stable and it was also confirmed by IR study that dried sludge samples showed significant presence of water at room temperature while the samples heated up to 400°C, the presence of water was barely indicated. *(Journal of Environmental Science and Technology 2 (1): 63-67, 2009* ***doi:*** *10.3923/jest.2009.63.67)*

Influence of Cadmium and Lead Concentrations of Irrigation Water on Dry Matter Yield of Vegetables

E. Mensah, M. Bonsu, S.N. Odai, R. Shoji, N. Kyei-Baffour and E. Ofori

The aim of the study was to find out the extent that cadmium and lead concentrations in irrigation water affect yield of vegetables like cabbage, lettuce and carrots negatively or positively. Experimental plots were established to produce cabbage, carrots and lettuce. The crops were irrigated with irrigation water of 0.05 and 0.1 mg L^{-1} Cd and 30 and 50 mg L^{-1} Pb concentrations. Results of analyzed crops samples showed that generally, there was a reduction of dry matter yield of crops produced. Dry matter yield of cabbage and lettuce treated with 0.05 mg L^{-1} Cd concentration of irrigation water reduced by 56.10 and 10.65%, respectively. At 0.1 mg L^{-1} Cd irrigation water concentration the reduction of cabbage and lettuce dry matter yield were 61.17 and 16.57%, respectively, compared with values of controlled crops. However, in the case of carrots there were increases in dry matter yield of 268 and 187%, respectively irrigating with water with Cd concentrations of 0.05 and 0.1 mg L^{-1}. With Pb irrigated vegetables, dry matter yield for all the three crops reduced at all Pb irrigation water concentrations. Dry matter yield of Pb treated cabbage reduced by 56.6, 13.54% for lettuce and 35.83% for carrots at 30 mg L^{-1} Pb irrigation water concentration. At 50 mg L^{-1} Pb irrigation water concentration, dry matter contents of cabbage, lettuce and carrots reduced by 72.85, 43.23 and 24.57%, respectively, compared with values from controlled plots. *(Journal of Environmental Science and Technology 2 (1): 68-72, 2009* ***doi:*** *10.3923/jest.2009.68.72)*

Heavy Metals Contents on Beach Sediments North and South of Sohar Industrial Area, Oman

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A total of 63 surface sediment samples from three sites: Harmul north of Sohar industrial area, Majees south of Sohar industrial area and Zafaran nine kilometers south of Majees were collected in November 2005. They were analyzed for 11 heavy metals including: Vanadium (V), chromium (Cr), manganese (Mn), nickel (Ni), copper (Cu), selenium (Se), mercury (Hg), cadmium (Cd), lead (Pb), zinc (Zn) and arsenic (As) using microwave digestion followed by Inductively Coupled Plasma-Mass Spectrometry (ICP-MS). The concentrations of chromium, manganese and vanadium were higher in Harmul than Majees and Zafaran. Arsenic concentration was generally low except in some stations. The results revealed that heavy metals concentrations in these sites are not alarming. *(Journal of Environmental Science and Technology 2 (2): 73-79, 2009* ***doi:*** *10.3923/jest.2009.73.79)*

Determination of Land Data of Ergene Basin (Turkey) by Planning Geographic Information Systems

Ş. Ordu and A. Demir

Geographic Information Systems (GIS) provide to gather environmental, legal and positional whole data pertaining to land. GIS is used to make future plans with the maps formed by digitizing informations gathered from land data. In the study, positional data pertaining to Ergene Basin where is chosen as the area of study are first processed into GIS medium and then thematic maps of the region are formed. It is aimed with the maps prepared within the context of the study to form a base in making further plans for basins. *(Journal of Environmental Science and Technology 2 (2): 80-87, 2009* ***doi:*** *10.3923/jest.2009.80.87)*

Detection of Some Heavy Metals Due to Sewage Water Diffusion into Planted Land

Rafat M. Nejem, Nizam M. El-Ashgar, Mahmoud M. Issa and Mohamad Al-Slieby

The concentrations and transfer factor of some heavy metals including copper (Cu), zinc (Zn), silver (Ag), lead (Pb), mercury (Hg) and cadmium (Cd) in some

fruit and leaves of plants grown in the polluted soil of Um Al Nasser village were determined using atomic absorption spectroscopy. The study showed a significant pollution of plants with some of the studied metals which exceeded in some cases the allowed values approved by WHO and FAO. The concentrations of copper, zinc, silver, lead and mercury were in the range: 0-14.5 , 5.9-115.4, 0-1.8, 0- 68.0 and 7.3-29.6 μg g^{-1}, respectively. No significant amount of cadmium was detected. Transfer factor was varied amongst the plants and also amongst the species of the metals. *(Journal of Environmental Science and Technology 2 (2): 88-94, 2009* ***doi:*** *10.3923/jest.2009.88.94)*

Extraction of Eleven Polycyclic Aromatic Hydrocarbons in Water Samples

W. Kanchanamayoon and N. Tatrahun

Eleven polycyclic aromatic hydrocarbons namely; naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, anthracene, fluoranthene, pyrene, benzo[b]fluoranthene, benzo[a]pyrene and benzo[ghi]perylene were extracted simultaneously by solid phase and analysis by gas chromatograph. The LC-18 solid phase showed good recoveries for extraction of 11 PAHs by using 3 mL of the mixture of (1:1:1) dichloromethane: cyclohexane: hexane as eluent, the percentage recoveries were in the ranges of 84.31-97.38 with the standard deviation of 1.56-5.36. The detection limits for solid phase extraction were in the ranges of 0.06-0.55 ppm. Application for analysis of water samples were done by this technique. The concentration of PAHs in water samples were found slightly varied from the location. The advantages of solid phase are solvent consumption, reuse in several times and pre-concentration. *(Journal of Environmental Science and Technology 2 (2): 95-99, 2009* ***doi:*** *10.3923/jest.2009.95.99)*

Evaluation of Road Pavement Density Using Ground Penetrating Radar

RSA Raja Abdullah, H. Zulhaidi M. Shafri, R. Mardeni, Sabira Khatun and R. Muniandy

This study describes an analysis of Ground Penetrating Radar (GPR) measurements at frequency range of 1.7-2.6 GHz to get a relationship between attenuation and density for nine road pavements slabs with different densities. There are about four different frequencies had been tested. The method is simple, fast, non-destructive and accurate way to determine the density of road pavement.

Density is a one of the important parameter in order to determine the compressive strength of road pavement for road user safety. In laboratory, the measurement system consists of a signal generator (250 kHz-3 GHz) as a source, spectrum analyzer (100 Hz-8 GHz), directional coupler with adapter and horn antenna. The first part of the measurement system setup is to determine the amplitude of transmitted wave (received signal strength). A few of received signal strength and attenuation for nine road pavement slab samples were taken at four different frequencies. An instantaneous method for measuring the density of road pavement was developed by using microwave reflection technique and free space method. The MATLAB software is used to analyze the measurement data and also for the graphs comparisons. At the end of this study, it is found that density plays an important factor in causing a major in the recorded signal strength as well as the differences of attenuation of the GPR signal. *(Journal of Environmental Science and Technology 2 (2): 100-111, 2009* ***doi:*** *10.3923/jest.2009.100.111)*

Combined Processes for Phosphorus Removal from a Dairy Plant Wastewater: Conditions Influencing the Chemical Process

O. Balamane-Zizi and H. Ait-Amar

The aim of this study is to asses the efficiency of a possible combination of the chemical and biological processes to enhance the phosphorus removal from a dairy plant wastewater which contains important amounts of phosphates and organic matter (PO_4^{3-} -P in range of 9-45 mg L^{-1} and COD in range of 200-5000 mg L^{-1}). In a first time, batch tests conducted in jar test were used to determine the pH and the molar ratios Fe:P and Al:P in order to optimise the chemical process. In this case, pH = 7, molar ratio Al: P = 3 and pH = 4 ; molar ratio Fe: P = 3 were obtained, respectively for aluminium sulphate and ferric chloride used as precipitants. In a second time, kinetics of biological phosphorus removal were studied by batch tests at three temperatures (13, 23 and 33°C) in order to show the importance of temperature in biological processes. These tests were conducted with the mixture of supernatant obtained after the precipitation of phosphates at optimum conditions (by ferric chloride and aluminium sulphate) and activated sludge originate from wastewater treatment plant of Staoueli at east of Algiers. The results obtained indicated that biological phosphorus removal could indeed be feasible to enhance the remove of phosphates from dairy processing wastewaters. The effect of temperature had also been studied in order to show the importance of temperature in biological processes. The results obtained showed that an increase of temperature accelerates the process. *(Journal of Environmental Science and Technology 2 (2): 112-119, 2009* ***doi:*** *10.3923/jest.2009.112.119)*

A Review on the Environmental Issues in Jeddah, Saudi Arabia with Special Focus on Water Pollution

Saleh Faraj Magram

This study seeks to compile data on environmental issues in Jeddah, which is the most significant commercial city in Saudi Arabia, through a comprehensive review of the available studies. The growth of the city of Jeddah over the last fifty years and particularly in the last thirty has been rapid and diverse. Due to lack of proper care, unfortunately the development activities were accompanied by environmental degradation. Today there are many integrated management issues that relate not only to water, but also the air, land and the marine resources of Jeddah. This study systematically compiled data on environmental issues in Jeddah. Special focus was given on the water issues. It became evident through the review of the available past studies and recommendations that a significant problem in solving the environmental issues is related to the issues of integrated environmental management. Some actions that should be considered in order to resolve the high priority issues were proposed. *(Journal of Environmental Science and Technology 2 (3): 120-132, 2009* ***doi:*** *10.3923/jest.2009.120.132)*

Evaluation of a New Egyptian Probiotic by African Catfish Fingerlings

A.M. Abdelhamid, A.I. Mehrim, M.I. El-Barbary, S.M. Ibrahim and A.I. Abd El-Wahab

A preliminary study (120 days) was conducted on African catfish (initial body weight 90 g) to evaluate the beneficial effects of a new patent local probiotic (T-Protphyt 2000) when added to their diet (25% crude protein) at graded levels (0, 1, 2 and 3 g kg^{-1} diet). The diet containing 1 g kg^{-1} (T_2) reflected the best growth and feed utilization parameters. Increasing the probiotic level increased fish carcass protein, fat and energy contents, as well as RBCs, WBCs, platelets and A/G ratio but decreased blood proteins. Also, T_2 treatment led to improvement of most histometric characteristics of the dorsal muscles of African catfish compared with the control (T_1) and other treatments (T_3 and T_4). The bacterial activity of this probiotic was tested *in vitro* against nine of pathogenic strains of Gram-negative bacteria (*Aeromonas hydrophilla*, *Pseudomonas aeruginose*, *Pseudomonas fluorescent*, *Vibrio* sp., *Klebsiella* sp., *Shigella* sp., *Salmonella* sp., *Proteus* sp. and *Escherichia coli*) at two concentrations (120 and 240 μg) compared with oxytetracycline (OTC 30 and

60 µg). The results showed positive effect of the probiotic at the two concentrations against all the tested bacteria. *(Journal of Environmental Science and Technology 2 (3): 133-145, 2009* ***doi:*** *10.3923/jest.2009.133.145)*

Impact of Combined Industrial Effluent on Metal Accumulation, Nitrate Reductase Activity and Yield of Two Cultivars of *Vigna unguiculata* (L.) Walp

C.E. Umebese, O.E. Ade-Ademilua and B.O. Olonisakin

Combined industrial effluent from Ikeja Central Treatment Plant, Lagos, was used to irrigate *Vigna unguiculata* L. Walp (cowpea), cultivars IT89KD-349 (white) and IT84E-124 (red). The effluent was alkaline (pH 9.8) and had a significantly higher concentration of Ca (11.53 mg L^{-1}), NO_3 (83.20 mg L^{-1}), SO_4 (22.73 mg L^{-1}), Cl (15.45 mg L^{-1}) and Cd (2.16 mg L^{-1}) than the experimental soil. Nitrate reductase activity was enhanced almost throughout the period of growth of both treated cultivars but for the peak at 35 DAP shown by control white. There was a corresponding increase in the net assimilation rate and a significant increase ($p \leq 0.05$) in the biomass of leaves and pods of treated red cowpea but only the pods of treated white cowpea. Heavy metal uptake by seeds of treated plants was negligible and this may be attributed to the high accumulation of Ca by these seeds. Undiluted combined industrial effluent has good agro potential in the cultivation of red cowpea. *(Journal of Environmental Science and Technology 2 (3): 146-152, 2009* ***doi:*** *10.3923/jest.2009.146.152)*

Synthetic Textile Effluent Removal by Skin Almonds Waste

F. Atmani, A. Bensmaili and N.Y. Mezenner

In the present study, natural and treated skin almonds were used as adsorbents for adsorption kinetics of methyl orange (acid dye) and crystal violet (basic dye). Skin almonds were treated by three different types of chemical treatments: acidic treatment (H_2SO_4), alkaline treatment (NaOH) and salt treatment ($MgCl_2$). The maximum adsorption capacities of crystal violet onto skin almond and methyl orange onto natural and treated skin almond with H_2SO_4 were 85.47, 15 and 31.94 mg g^{-1}, respectively, at 23°C. Untreated skin almonds might be a good adsorbent for the removal of basic dye from water solution. The fitness of both Langmuir and Freundlich adsorption model on describing the equilibrium isotherms of Crystal Violet (CV) and Methyl Orange (MO) were examined. The experimental data fitted very well the pseudo second order kinetic model and also

followed by intraparticle diffusion model. The results show that the sorption capacity decreases with an increase in solution temperature from 23 to 50°C. The thermodynamics parameters were evaluated. The negative value of enthalpy (ΔH°) indicated that the adsorption of both dye onto skin almonds were exothermic, which result was supported by the decreasing adsorption of dye with temperature. *(Journal of Environmental Science and Technology 2 (4): 153-169, 2009* ***doi:*** *10.3923/jest.2009.153.169)*

Socio-Economic Aspects of Wastewater Reuse in the Gaza Strip

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The main concern of the current research is to investigate the socio-economical aspects of reuse which rarely discussed in Gaza Strip. Questionnaire to farmers in three areas in Gaza Strip have been conducted and analysis and two sites irrigated with treated effluent was monitored. The study indicates an economical improvement for farmers switching from groundwater to effluent irrigation, even though full yield potential of citrus and olive. *(Journal of Environmental Science and Technology 2 (4): 170-178, 2009* ***doi:*** *10.3923/jest.2009.170.178)*

Environmental Assessment due to Air Pollution near Iron Smelting Industry

R. Arunachalam, K. Paulkumar, A.J.A. Ranjitsingh and G. Annadurai

The present investigation was on iron smelting industry which was located in Papankulam-Madavarvilagam Village, Tamilnadu, India and polluting the environment in the forms of fumes. The pollutant seems to affect the various plants and human beings residing at the vicinity of industry. In this industry, for a month 40-50 tones of ferric sulphate was produced using sulphuric acid, nitric acid and iron which were considered major environmental contaminant. Ditch, well, bore-well waters, plant samples like coconut tender water, *Cassia auriculata* and *Opuntia elatior* extracts were captivated from pollutant and unpollutant sites and the concentration of iron content in the captivated water samples and plant extracts were monitored and also the effect of iron on the physiology of plants was studied. On the basis of results, we concluded the exhaust from the iron smelting industry had a telling effects on the near by ecosystem. Accordingly, continuous monitoring of this polluted study site can be helped to solve this air pollution. *(Journal of Environmental Science and Technology 2 (4): 179-186, 2009* ***doi:*** *10.3923/jest.2009.179.186)*