



ENVIRONMENTAL POLLUTION ASSESSMENT & ANALYSIS

Dr. Neha Mumtaz



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STUDY ON BIOSORPTION OF CHROMIUM FROM TANNERY EFFLUENT BY USING ACTIVATED NEEM (AZADIRACHTA INDICA) LEAF POWDER

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Heavy metal contamination of the rivers is a worldwide environmental problem and its removal is a great challenge. The tanneries release their treated effluent in the nearby waterways containing Cr metal that eventually merges with the river. The effluent of tannery industries is the major source of chromium contamination in the ground and surface water. Neem leaves powder adsorbent used in this study has been prepared at laboratory scale and has been observed to be very effective for removal of chromium from aqueous solution. In this study, a different method of investigation and detailed experimental procedure were taken into consideration to obtain the effect of pH, dosage concentration, and contact time on batch absorption. The biosorption of metal shows in the present study that the naturally occurring microbes have enough potential to mitigate the excessive contamination of their surroundings and can be used to reduce the metal concentrations in aqueous solutions in a specific time frame. The removal of chromium (VI) by activated Neem leaves powder adsorption by batch adsorption studies exposes that Neem leaves powder has an essential capacity for biosorption of Cr-(VI) from effluent. The maximum removal efficiency is tended up to 94.5% for bio sorbent prepared from Neem leaves.

The most common forms of chromium that occur in natural waters in the environment are trivalent chromium (chromium-III), and hexavalent chromium (chromium-VI). Both valences of chromium are potentially

ASSESSMENT OF WATER QUALITY DUE TO SOLID WASTE DISPOSAL ON THE GHATS OF RIVER GANGA AT BANARAS

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Assessment of water quality was done in the holy River Ganga district of Varanasi, (U.P.) India in 2009. The Ganga, one of the world's major rivers, has been venerated as the holiest and is bound with countless beliefs and faiths, especially in India and adjacent countries. Its water has traditionally been regarded as pure and holy in nature gift to humans. Recent experiences however do not warrant such complacency. The water resources are strained to a non-sustainable level due to rapid population growth, urban development, industrialization; livestock, and power production on the Ganga Ghats at Varanasi city. The severe pollution stress and causes to which its water is subjected to the contents and quality of water and possible remedial measures. Based on our experimental results it can be concluded that Assi Ghat exhibited a higher pollution index than other ghats due to higher values of Turbidity, pH, BOD, Hardness, Alkalinity, and Nitrate disposal occurring at Assi Ghat as well as disposal of industrial sewage in the Assi Ghat. Regular monitoring of Ganga river water quality is necessary to have a check on surface water quality for the sake of human life & to maintain a balanced aesthetical value of religion. We have to restore the environmental quality of Ganga which is amended by policy makers of the Indian constitution.

Varanasi is an ancient religious city, on the bank of the holy river Ganga. Being a prominent pilgrimage center, thousands of tourists visit the sacred city Varanasi from India and abroad. According to historians, the city was founded some ten centuries before the birth of Christ. The

RECOVERY OF PARACETAMOL AND ACETIC ACID FROM WASTEWATER GENERATED FROM PARACETAMOL SYNTHESIS

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An improved process for the synthesis of paracetamol. p-aminophenol is acetylated in an aqueous medium to produce a crude aqueous reaction mixture and paracetamol product is recovered by crystallization from an aqueous system comprising the reaction mixture. According to the improvement, paracetamol was recovered by filtration, and the filtrate contained acetic acid & dissolved paracetamol. The filtrate (as a solvent) is a required amount sent to the reactor for paracetamol synthesis and the excess amount of filtrate is stored in a storage tank for distillation. According to that, the required amount of filtrate is used as a solvent from the 2nd batch to the 12th batch, finally, total filtrate goes to distillation to recover acetic acid and distilled residue goes to another storage tank for neutralization and after filtration, the filtrate as influent goes the solar panel for evaporation and collected a small scale residue from solar panel goes to incineration.

Paracetamol was first synthesized in 1878 by Morse and introduced for medical usage in 1883. However, due to misinterpretation of its safety profile, it enjoyed only limited use until the 1950s, when the chemically similar, and up until then preferred analgesic, phenacetin was withdrawn because of renal toxicity. Paracetamol is now probably the most commonly used drug worldwide, available over the counter, used in almost all ages, and forming Step 1 of the WHO analgesic ladder. First-

ASSESSMENT OF AMBIENT AIR QUALITY OF LUCKNOW CITY AND PROPOSING A MODEL USING MATLAB

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Air quality is one of the major environmental issues of Lucknow city. This is a result of an increase of vehicular outflows and gradual escalating private vehicles on street, Rapid urbanization, Industries encompassing the city, the Unconsciousness of government and public toward this issue, the burning of woods for fuel purposes and the burning of the garbage leads to excessive pollution load. The objective of this book chapter is to analyze the ambient air pollution status of a city by using soft computing in data interpretation. A systematic review of the existing MATLAB toolbox has to turn out to be a good option for predicting and analyzing the future impact of air pollution on various zones of Lucknow. The study relates to the application of the MATLAB toolbox technique in evaluating contamination status in the city of Lucknow, India. The point of this investigation was to address air quality assessment utilizing the MATLAB toolbox assessment model and to predict the best possible approach on the assessment of air quality parameters. In point of view of the rapid development of Lucknow city in terms of area, inhabitants, and number of enrolled vehicles, arranging and usage of appropriate air contamination control measures are important to ensure the strength of its residents.

Pollution means the contamination of the air. As per section 2(a) of the Air (Prevention and Control of Pollution) Act, 1981 air pollution has been defined as, “ any solid, liquid or gaseous substance (including noise) present in the atmosphere in such concentration as may be or tend to be injurious to the human being or other living creatures or plants or

DOMESTIC WASTEWATER TREATMENT BY AQUATIC PLANTS

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All over the world wastewater pollution is common. Untreated municipal wastewater posing eutrophication, where water is enriched with nutrients and unhygienic to use. Control of eutrophication is burning issues for aquatic sites around the world. In such a state, remediation of nutrients by aquatic plants is remarkable for municipal wastewater treatment. Present study was conducted by off-site experiment, where *Hydrilla verticillata* Casp was cultured in a tub. Second one of the tub was used as control. The quality of domestic wastewater was assessed before and after the experiment. The results of the present experiment revealed the significant improvement in the quality of municipal wastewater, as indicated by the decrease in values of most physicochemical parameters studied. That showed efficiency and potentiality of aquatic plant for the purpose.

Wastewater generally is made of black water and grey water. Grey water, sometimes spelled gray water, gray water or grey water and also known as sullage, is non-industrial wastewater generated from domestic processes such as washing dishes, laundry and bathing. Grey water comprises 50-80% of residential wastewater. Grey water is distinct from black water in the amount and composition of its chemical and biological contaminants (from feces or toxic chemicals). Treated greywater has many uses, for example toilet flushing or irrigation [6]. Grey water gets its name from its cloudy appearance and from its

ASSESSMENT AND COMPARISON OF NOISE POLLUTION IN COMMERCIAL AND RESIDENTIAL AREA IN LUCKNOW AND ITS IMPACT ON THE HEALTH/SURROUNDING ENVIRONMENT

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The examination looks at the issue of sound contamination in the wake of its evil impact on the life of the general population (health) and the surrounding environment. A cross-sectional review of the population in the world calls attention that the main sources of noise pollution are industrial, commercial, traffic, and various public and private ceremonies using loudspeakers in the residential zones. They also describe the current standards and practices and some of the suggestions in literature to study the impact and comparison. The present study focuses on the assessment and comparative effect of noise pollution in residential areas viz. Vikas Nagar, Indira Nagar, Aliganj and commercial area viz. Charbagh, Chowk, Aminabad in Lucknow with standard and its effect on the health.

The research also emphasizes the ten-year data of noise pollution. Noise is a prominent feature of the environment including that from sources such as transport, industry, and neighborhood. Noise pollution is becoming more and more acute, and hence many researchers are studying the effect of noise pollution on people and its attenuation.

A questionnaire survey was conducted to know the health impact of the population in residential and commercial areas in Lucknow.

Sound which is unwanted or disrupts one's quality of life is called noise. When there is a lot of disruption in the environment, it is termed

STUDY AND EVALUATION OF WATER QUALITY OF RIVER GANGA AT DIFFERENT GHATS OF VARANASI CITY

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This chapter is attempt to analyze the water quality of river Ganga in Varanasi city. The present investigation reveals the seasonal changes in concentration of physico-chemical parameters in river Ganga at different Ghats of Varanasi city. Water samples were collected from the different sites viz: Santravidas Ghats, Assi Ghats, Harish Chandra Ghats, Dasawamedha Ghats, Lalita Ghats, Mannmandir Ghats, Manikarnika Ghats of Varanasi during Rainy & winter seasons in year 2016-2017. The physico-chemical parameter such as pH-value , Temperature ,Dissolved Oxygen (DO) , Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD) , Total alkalinity (TA) , Total Hardness (TH) , Total Dissolve Solids (T.D.S) ,Turbidity , Chloride were used to analyses the pollution of river Ganga at selected sites. Comparison of estimated values with WHO and standard quality management revealed that water of study area is polluted which may be harmful for both aquatic bio-system as well as human beings. This results also revealed that the water quality was severely polluted in monsoon and moderately polluted in winter season.

Ganga is the sacred river of India. Ganga originated from the Gangotri Glacier , which is located in the western Himalayas. It is one of the major rivers of India. Water is the most precious gift of the nature to mankind. Life and activities cannot be possible without water. On surface of the Earth, water is in the form of oceans, glaciers, freshwater bodies, rivers, wells, lakes etc. occupies about 71% of the area while , landmass occupies about 29% of area. Approximately 45,000 km long

COMPARATIVE STUDY ON HOUSEHOLD PLANTS IN THE REMOVAL OF INDOOR AIR POLLUTANTS

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As we all know people spend maximum time in home, offices and other indoor areas and due to poor air quality people suffer from various kind of diseases and also make existing health problem worse. Indoor air pollution poses a greater risk than outdoor air pollution which is still being ignored specially in the developing country. Due to poor designing and poor ventilation system air quality of indoor is getting worst not use of air purifier for the purification of air become costly. So Indoor Air Quality can be improved by using various decorative plant which can be used in our home easily. These plants do not required much care (i.e limited water and light) and can reduce 80% -90% of toxic pollutants and also can produce sufficient oxygen for the survival. These plants helps in creating positive environment in our home due to which people may spend happy life without any health issue. There are so many indoor plants which are present in the market which can act as pollution removal plant. This project consist of comparison of various decorative plant for the removal of indoor air pollutant, there comparative study and level of pollution reduction are shown. In this study three plants are selected after through literature review and found that these plants are very effective in reducing the indoor air pollutants such as Sulfur Dioxide, Nitrogen Dioxide, PM10, RSPM2.5. These pollutants are very much common in indoor areas, as they are released because of running of various appliances, burning of fuel or other daily activity. Individual plant and pair of plant is placed in a transparent chamber with pollutant measuring instrument for three days. After collecting all the reading their comparison is made and graph is plotted between rate of reduction of pollutants and selection of the plant or combination of plants which will be the final result of this study.

DEVELOPING WATER QUALITY INDEX OF RIVER GANGA THROUGH CCME METHOD AND APPLICATION OF PRINCIPAL COMPONENT ANALYSIS (PCA)

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Water Quality Index (WQI) is one of the most widely used method for representation of the quality of a water resource. This idea has wide acceptance among policy makers and other stakeholders as this gives a clear and comprehensive picture of the status of the pollution in a water body. This study has been performed on river Ganga at seven locations covering about 222 Km of middle stretch of Ganga in Uttar Pradesh with study of 14 parameters. Principal Component Analysis (PCA) of the collected samples shows that seven (07) water quality parameters account for about 88-93% variation in WQI at all location. Parameters deemed relevant through PCA are -Ammonical Nitrogen Biological Oxygen Demand (BOD), Chlorides, Dissolved Oxygen (DO), Fluoride, Nitrate, pH. The water quality has been evaluated using the Canadian Council of Ministers of the Environmental Water Quality Index (CCME WQI) method. The study shows good water quality at the first station Panchal Ghat, (Farrukhabad) and there after water quality decreases. The CCME WQI value ranged between 66.67- 83.41 which indicates good to marginal water quality. This study shall play vital role in the development of Water Quality Index of various water bodies with substantial and practical correctness.

Rivers have been an integral part of human element since the dawn of civilization. The Ganga is largest basin of the Indian subcontinent. They are crucial for maintaining the ecological balance and betterment of

ASSESSMENT OF NOISE QUALITY AT DIFFERENT METRO CONSTRUCTION SITE IN LUCKNOW

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Noise is usually associated with construction work due to rapid urbanization. Noise may adversely affect the health, including effects such as stress, sleep disturbance, high blood pressure and even hearing loss. Noise pollution means any sound that is undesired by the recipient. The effect of sound on human depends upon its frequency. Human ear are known to be sensitive to an extremely wide range of intensity varied from 0 to 180dB. The noise is generated by the human through various ways like construction instruments or equipments used in metro construction site and traffic hindrance are cause of noise pollution. Noise pollution in the recent times has been well recognized as one of the major cause that impact the quality of life in urban areas across the globe. The aim of this study was to assess the sources and noise levels, and possible impacts on selected metro construction site. Its adverse impact on health like hearing impairment, agitation, depression.

Lucknow the capital of Uttar Pradesh is situated between $26^{\circ} 52'$ N latitude and $80^{\circ} 56'$ longitude, 120 m above sea level .The population of city is 2817105 as per 2011 census and has an area of 310sq. km. Noise is often defined as unwanted sound which is the result of pressure changes in a medium [usually air] caused by vibration or turbulence. The amplitude of these pressure changes is stated in terms of sound level and the rapidity with which these changes occur sound levels are measured in decibels (db) unit sound frequency is stated in terms of cycles per second or now a day; hertz(Hz). Audible sound can be at