

Evaluating the Efficiency of Putrescible Organic Waste for the Removal of Acidic Dyes Employing Artificial Neural Network Modeling

Meena Sundari Perumalsamy

Jansons Institute of Technology, Department of Chemistry, Coimbatore-641 659

The present work focuses on preparation of activated carbon from putrescible organic wastes. Activated carbon were characterized and phosphoric acid impregnated carbon (PAC) which had a surface area of about 603.7 m²/gm with porous and amorphous structure was selected for the study. It was utilized for the removal of acidic dyes, such as acid orange 8 (AO8) and acid red 52 (AR52). For both the dyes Langmuir isotherm fitted well. Pseudo second order kinetics was followed by the dyes. Spontaneity and endothermic nature of the reaction was proved by Van't Hoff plot. Study also found that acid orange 8 could be easily desorbed than acid red 52. Artificial neural network (ANN) modeling predicted the mean square error values as 1.62×10^{-14} and 2.47×10^{-24} for acid orange 8 and acid red 52, respectively. The study revealed that acidic dyes can be easily removed by phosphoric acid impregnated carbon prepared from putrescible organic waste.

KEYWORDS

Putrescible organic waste (POW), Freundlich Langmuir, Artificial neural network (ANN) modeling, Van't Hoff, Desorption.

AUTHOR

1*. Dr. Meena Sundari Perumalsamy, Associate Professor, Department of Chemistry, Jansons Institute of Technology, Karumathampatti, Coimbatore-641 659.

Evaluation of the Metrological Characteristics of Natural and Treated Waters With Stable Salt Composition Identification Method

Valentyna Loboichenko¹, Vladimir Andronov² and Victor Strelec³

1. *National University of Civil Defence of Ukraine, Department of Occupational, Technogenic and Environmental Safety, Chernishevskaya Street, 94, 61023, Kharkiv, Ukraine*

2. *National University of Civil Defence of Ukraine, Research Center, Chernishevskaya Street, 94, 61023, Kharkiv, Ukraine*

3. *National University of Civil Defence of Ukraine, Scientific Department on Problems of Civil Protection and Technogenic and Ecological Safety, Chernishevskaya Street, 94, 61023, Kharkiv, Ukraine*

The research paper contains the analysis of surface and groundwaters quality evaluation approaches. It has been stated that the initial stage of waters identification can be carried out with the help of one or a range of criteria. Known identification approaches are expensive, time consuming or require an immense amount of data. Natural and treated waters with stable salt composition identification method based on the initial water electrical conductivity as well as the identification coefficient measurement are suggested to use. The method is express, inexpensive, simple in implementation and environment friendly. As illustrated by the selection from 35 natural and treated water samples, the metrological characteristics of the method have been measured, precisely the uncertainty according to type A and B as well as the expanded uncertainty have been defined. It has been also demonstrated that the value of the standard total uncertainty is influenced by both type A and type B uncertainty. In addition, it has been presumed that the relative expanded uncertainty of natural and treated waters with stable salt composition identification method is not more than 4% for waters with the mineralization of 0.005 - 30 gm.

KEYWORDS

Water quality, Identification, Conductivity, Identification coefficient, Uncertainty.

AUTHORS

1*. Dr. Valentyna Loboichenko, Associate Professor, Department of Occupational, Technogenic and Environmental Safety, Faculty of Technogenic and Environmental Safety, National University of Civil Defence of Ukraine, Chernishevskaya Street, 94,61023, Kharkiv, Ukraine.

2. Prof. Vladimir Andronov, Vice-Rector for Research – Head of Research Centre, Colonel of Civil Protection Service and S. Dr. (Technical Science). National University of Civil Defence of Ukraine, Chernishevskaya Street, 94,61023, Kharkiv, Ukraine.

3. Victor Strelec, Associate Professor, Scientific Department on Problems of Civil Protection and Technogenic and Ecological safety, Senior Researcher and S. Dr. (Technical Science), National University of Civil Defence of Ukraine, Chernishevskaya Street, 94,61023, Kharkiv, Ukraine.

Assessment of Spatial and Seasonal Water Quality Variation of River Ghaggar, Punjab

Sarish Khera¹ and Yadvinder Singh²

1. Hindu College, Department of Geography, Amritsar

2. Punjabi University, Department of Geography, Patiala

The present study has been made to evaluate the status of physico-chemical contaminants in river Ghaggar in Punjab State. It receives a huge amount of waste, as it passes through urban and industrial areas. Therefore, the assessment of water quality of river Ghaggar is done at seven sampling points in Punjab from 2002 to 2015 for pre-monsoon and post-monsoon seasons. The physico-chemical parameters, such as pH, electrical conductivity (EC), dissolved oxygen (DO), biological oxygen demand (BOD), chemical oxygen demand (COD), total coliform, faecal coliform and NO₃ have been analysed. The results were compared with water quality standards prescribed by Bureau of Indian Standards (BIS) and World Health Organization (WHO). The correlation coefficients were calculated to identify highly correlated parameters. The study suggests that the quality of river Ghaggar becomes extremely deteriorated due to industrial and domestic discharge in the river.

KEYWORDS

Pollution, Physico-chemical analysis, Sewage treatment plants, Correlation.

AUTHORS

1*. Sarish Khera, Assistant Professor, Department of Geography, Hindu College, Amritsar.

2. Dr. Yadvinder Singh, Professor and Head, Department of Geography, Punjabi University, Patiala.

Impact on Lightning Plasma and Thunder Storms due to Change in Ratios of Gases in Atmosphere

Tabish Khan and Ram Raj Mathur

Osmania University, Centre of Exploration Geophysics, Department of Geophysics, Hyderabad - 500 007

Producing food, transportation and energy for seven billion people has led to large and widespread increases in the use of synthetic nitrogen (N) fertilizers and fossil fuel combustion, resulting in a leakage of NO_x , CO_2 , SO_2 , CFCs and many other gases into the environment as various forms of air and water pollution. In this paper as a part of geophysics and environmental science, we present the increase in gases, namely, NO_x , different CFCs and carbon dioxide in the atmosphere and their impact on the disembugue of high voltage lightning stroke from the upper atmosphere to earth surface (cloud to ground lighting). This would give an insight into the environmental change occurring and the necessary steps to be undertaken to improve the environment.

KEYWORDS

Air pollution, Air resistance, Cloud to cloud lighting, Cloud to ground lighting.

AUTHORS

1. Mr. Tabish Khan, Department of Geophysics, University College of Science, Osmania University, Hyderabad - 500 007.

2*. Dr. Ram Raj Mathur, Head and Chairman, BOS in Geophysics, Department of Geophysics, University College of Science, Osmania University, Hyderabad - 500 007.

Assessment of Water Quality, Heavy Metal Contamination and its Indexing Approach of Dhanas Lake in Patiala Ki Rao Reserved Forest Area, Chandigarh

Ravneet Kaur¹, Vincy Garg¹, Ramandeep Kaur¹, Sapna Pandit¹, Savita Verma Attri² and A.S. Ahluwalia³

1. Punjab University, Department of Zoology, Chandigarh
2. PGIMER, Department of Paediatrics, Chandigarh
3. Punjab University, Department of Botany, Chandigarh

The present study was undertaken due to incidences of mass death of fish during rainy seasons in Dhanas Lake at Chandigarh. With no baseline data available, it is difficult to comprehend the biodiversity loss. Therefore, physico-chemical characteristics, water quality index (WQI), heavy metal pollution index (HPI), bioaccumulation factor (BAF) in fish tissues and plankton diversity were assessed. Four sites were studied from the lake for all four seasons. Poor water quality index observed in rainy and summer season. Heavy metals in water were within the permissible limits in the order of As>Cr>Pb>Hg>Cd. Heavy metal pollution index value estimated was 74.54 representing heavy metal contamination. Bioaccumulation factor of heavy metals depicted the highest accumulation in gills. Poor plankton diversity was recorded with dominating *Microcystis*.

KEYWORDS

Lake, Physico-chemical parameters, Water quality index (WQI), Heavy metal pollution index (HPI).

AUTHORS

- 1*. Ravneet Kaur, Department of Zoology, Punjab University, Chandigarh.
2. Vincy Garg, Department of Zoology, Punjab University, Chandigarh.
3. Ramandeep Kaur, Department of Zoology, Punjab University, Chandigarh.
4. Sapna Pandit, Department of Zoology, Punjab University, Chandigarh.
5. Savita Verma Attri, Department of Paediatrics, PGIMER, Chandigarh.
6. A.S. Ahluwalia, Department of Botany, Punjab University, Chandigarh.

Heavy Metal Concentrations in Soils and Sediments of Visakhapatnam Mangroves With Special Reference to Pollution Risk

K. Anand Raju¹, P. Shanmukh Anand² and Ch. Ramakrishna¹

1. *Gandhi Institute of Technology and Management (GITAM), Department of Environmental Studies, GITAM Institute of Science, Visakhapatnam - 530 045*

2. *Gandhi Institute of Technology and Management (GITAM), Department of Biotechnology, GITAM Institute of Science, Visakhapatnam - 530 045*

Distribution of metals in water bodies may consequently be accumulated in sediment and soil because of low solubility after that become sensitivity indicator for mangroves. Heavy metal pollution due to sewage and industrial effluents was recognised as a serious threat to mangrove ecosystems. Visakhapatnam intertidal creek, Visakhapatnam Port Entrance Channel (VEC), is one such area receiving huge quantities of city sewage and from the nearby industrial zone, which includes petrochemical and fertilizer industries. All these discharges reach the entrance channel through various branches of the Meghadri Gedda, a small river drain. The present study reports the heavy metals accumulated in the soils of the mangrove region and sediments of the drain beds associated with the Visakhapatnam Entrance Channel in an attempt to compare with the available guidelines related to soil and sediments of the coastal wetlands. About six heavy metal pollutants concentrations (Cd, Cr, Cu, Mn, Pb and Zn) were recorded from the Visakhapatnam Entrance Channel soils and sediments and the ecological risk of these metals was computed based on the risk indicators. Results of the study revealed that the accumulation of metals in the sediment was relatively high compared to that in soils. The ecological risk potential (E_i^r) recorded was in the order of $Cd > Pb > Cr > Mn > Zn > Cu$ indicating that the ecological risk from Cd was high. The study suggests the need for the development of coastal and marine sediment quality guidelines for India.

KEYWORDS

Mangroves, Tidal creek, Sediment quality, Heavy metal pollution, Ecological risk index.

AUTHORS

1. Mr. K. Anand Raju, Research Scholar, Department of Environmental Studies, Institute of Science, Gandhi Institute of Technology and Management (GITAM), Visakhapatnam - 530 045.

2. Dr. P. Shanmukh Anand, Associate Professor, Department of Biotechnology. Gandhi Institute of Technology and Management (GITAM), Visakhapatnam - 530 045.

3. Prof. Ch. Ramakrishna, Professor, Department of Environmental Studies, Institute of Science, Gandhi Institute of Technology and Management (GITAM) University, Visakhapatnam - 530 045.

Groundwater Quality Assessment in Kandlakoya Village by Chemical Methods

Musini Venkateshwarlu¹, A. Kiran Kumar² and M. Narsi Reddy¹

1. *CMR College of Engineering and Technology, Department of Civil Engineering, Kandlakoya (V), Hyderabad-501 401*

2. *Osmania University, Department of Chemistry, University of Technology, Hyderabad - 500 007*

The quality of water is of vital concern for mankind since it is directly linked with human welfare. The tremendous increase in industrial activity during the last few decades and the release of obnoxious industrial wastes into the environment have been of considerable concern in recent years from the point of view of environmental pollution. Environmental pollution on one hand and deforestation and population explosion on the other, are threatening the very existence of life on earth. At present, the menace of water-borne diseases and epidemics still looms at large on the horizons of developing countries. Polluted water is the culprit in all such cases. The major sources of water pollution are domestic waste from urban and rural areas and industrial wastes which are discharged into natural water bodies. The physical condition of water (colour, taste and odour) might render it undrinkable.

KEYWORDS

Groundwater, Distribution diagram, Study area.

AUTHORS

1*. Dr. Musini Venkateshwarlu, Assistant Professor, Department of Civil Engineering, CMR College of Engineering and Technology, Kandlakoya, Hyderabad - 501 401.

2. Dr. A. Kiran Kumar, Assistant Professor, Department of Chemistry, University College of Technology, Osmania University, Hyderabad - 500 007.

3. Dr. M. Narsi Reddy, Professor, Department of Civil Engineering, CMR College of Engineering and Technology, Kandlakoya, Hyderabad - 501 401.

Tourism Influx A Potential Noise Pollution Threat : A Case Study of Udaipur

Pallavi Gothalkar, Nidhi Rai, Devendra Singh Rathore and Tanushree Kain

Mohanlal Sukhadia University, Department of Environmental Sciences, Udaipur - 313 001

The rapid development in the tourism industry is directly or indirectly increasing environmental problems of increasing noise level. Noise is an important pollutant of environment causing various health hazards. The paper discusses the noise pollution status of an important aesthetic, recreational and commercial tourist destination - Fateh Sagar Lake and Pichola Lake, in the district Udaipur of Rajasthan, in peak tourist season compared with lean tourist season in a year. It examines the noise levels caused due to various sources at the site and evaluates the conclusions drawn. The results of noise level monitoring revealed the fact that due to a higher amount of tourist in peak tourist season noise level was enhanced. The average equivalent noise level was increased from 65.2 dB to 79.7 dB (A) and 64.82 dB to 77.28 dB (A) from lean to peak tourist season, at Fateh Sagar Lake and Pichola Lake, respectively. The highest equivalent noise levels during peak days at Fateh Sagar is 79.7 dB at 20:00 hour which was 22.23% higher in comparison with lean days and 44.90% higher than the standard of Central Pollution Control Board (CPCB). Similarly the highest equivalent noise levels in Pichola during peak days was 77.28 dB (A) at 20:00 hour which was 19% higher in comparison with lean days and 40% higher than the standard of Central Pollution Control Board (New Delhi) on comparing the noise levels of lean and peak seasons. The p value (2 tailed) is equivalent to 0.0007, through standard criteria, this variation is studied to be exceptionally statistically significant. This scientific pursuit clearly indicates that the noise pollution is directly proportional to the tourist influx at the two tourist destinations in Udaipur city.

KEYWORDS

Environmental problems, Tourism, Noise pollution, Equivalent noise level.

AUTHORS

1. Ms. Pallavi Gothalkar, Research Scholar, Department of Environmental Sciences, Mohanlal Sukhadia University, Udaipur - 313 001.
2. Dr. Nidhi Rai, Professor, Department of Environmental Sciences, Mohanlal Sukhadia University, Udaipur - 313 001.
- 3*. Dr. Devendra Singh Rathore, Assistant Professor, Department of Environmental Sciences, Mohanlal Sukhadia University, Udaipur - 313 001.
4. Ms. Tanushree Kain, Research Scholar, Department of Environmental Sciences, Mohanlal Sukhadia University, Udaipur - 313 001.

Cement Establishments and Process at Ariyalur, the Cement City of India

Raajasubramanian¹, Krishna Ram Hanumappa² and Narendra Kuppan³

1. Annamalai University, Department of Botany, Annamalai Nagar-608 002, Chidambaram

2. University of Mysore, Department of Studies in Zoology, Mysore

3. MES College of Arts Commerce and Science, Department of Biology, Karnataka

Cement has been making concrete jungle, great infrastructure but the fact is that this infrastructure is built on the home for several living creatures natural habitant of earth. This paper attempts to give the detail process of cement manufacturing and the byproduct and its effect on life.

AUTHORS

1. Raajasubramanian, Annamalai University, Department of Botany, Annamalai Nagar-608 002, Chidambaram
2. Krishna Ram Hanumappa, University of Mysore, Department of Studies in Zoology, Mysore
3. Narendra Kuppan , MES College of Arts Commerce and Science, Department of Biology, Karnataka

Study on Soil Stabilization in Dehradun Region Using Plastic

Ankita Rawat

Uttaranchal University, Department of Civil Engineering, UIT, Dehradun - 248 001

Soil stabilization improves the physical properties, like shear strength, bearing capacity and stability of soil. This can be done by the use of waste material so that the waste material can be utilised in a good way with the use of some new techniques (compaction and addition of suitable admixture, etc). This technique can be effectively used to meet certain challenges. In hilly regions, it is very important to stabilize the soil to reduce the chances of natural causes, like land sliding, soil erosion. Plastic is one of the waste materials which are non-biodegradable so that it can be used to stabilize the soil. It is helpful in both ways - To reduce pollution and to stabilize the soil. Plastic bag strips can be used to reinforce the soil by mixing it with the soil and compact it with a mechanical technique which increases the CBR value of the soil. The result of the CBR test shows that the use of plastic strips increases the strength of the soil effectively.

KEYWORDS

Stabilization, Compaction, CBR, Plastic strips, Pollution.

AUTHOR

1*. Miss Ankita Rawat, M.Tech. Student in Environment Engineering, UIT, Uttaranchal University, Dehradun-248 001.