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Preliminary Investigation of Chemical Composition of Ballast Water Sediments in Selected Ships within the Lagos Harbour, Nigeria

Ballast water is important for safe and efficient operation of vessels, helping to maintain stability during voyage in seas and docking in harbours. However, ballast pose considerable environmental challenges because they are often laden with polluted sediments and invasive species. The Lagos Harbour, which houses in largest port in West Africa, receives about five thousand vessels annually which discharges ballast water and sediment into the water with the potential to cause environmental pollution. In the Nigerian context there is high potential for pollution due to weak regulations, poor enforcement and limited research of this kind in other to understand their composition, fate and impacts. This study aims at characterizing the chemical composition (Heavy metals- Arsenic, Cadmium, Chromium, Copper, Lead & Zinc, as well as carbon and nitrogen content) of the ballast sediment because of their positive correlation with the survival of invasive species in the ballast water and sediment tanks. A total of four ships (2 cargos and 2 tankers) were surveyed within Lagos Harbour and surface (1-5 cm) sediment samples were scooped using a specialized grab for sampling ballast sediments. The sediments were transferred in specialized cool boxes to the University of Portsmouth in United Kingdom for analysis. Total metal concentrations were analysed using X-ray fluorescence (XRF). They were subjected to two acid digestions: Aqua regia (AR) and 1 M hydrochloric acid (1 M HCl) following the procedures set out by the Canadian National Water Research Institute (NWRI) and the United States Environment Protection Agency (US-EPA Method 3050B). Total carbon and nitrogen contents were determined using an in-line Yanaco MT-5 CHN analyser. The results obtained were compared with established guidelines and subjected to correlation and Principal Component Analysis (PCA). The findings indicated high concentrations of Arsenic, Lead, Cadmium, Carbon and Nitrogen in the sediments. Tanker vessels contained relatively higher concentrations of the pollutants than cargo vessels. The findings from this study provides interesting baseline data which will guide a more intensive investigation of chemical composition of ballast water and sediments for effective comparison with what is obtainable elsewhere in the world. The maritime industry needs to pay close attention to ballast management particularly in developing countries like Nigeria where there is limited regulation for management of coastal areas with respect to shipping activities as a potential source of marine pollution. The IMO needs to direct further effort at investigating the non-biological components of ballast water and sediments in other to protect valuable biodiversity.

Biography

Awwal Bamanga holds a Ph.D. Degree in Marine Environmental Sciences from the University of Portsmouth, United Kingdom with specific research interest in harbour management. He has over seventeen (17) years working experience with the Nigerian Maritime Administration and Safety Agency (NIMASA) which is the focal agency implementing ports and flag states responsibilities for Nigeria. My responsibility with maritime safety administration involves regulating shipping activities in relation to ensuring safer seas and protection of marine environment in line with the International Maritime Organization (IMO) Conventions and Protocols as well as the Nigerian Merchant Sipping Act. Over the years, he has developed keen interest in the management of coastal environments, with respect to domestication of IMO conventions and protocols in order to promote trade, safety and security as well as prevent marine pollution. Also, he has interest in port development and services, as well as enhancing network of coastal ports to hinterlands via inland water channels. Considering these, he had participated in numerous international meetings and conferences of maritime concerns such as Marine Environment Protection Committee (MEPC) working groups on chemical tracking, International Oil Pollution Compensation (IOPC) fund, Ballast Water Management Conventions (BWMC), amongst others. With my experience in the maritime industry, he has the capability to engender effective regional collaboration and ensure private-sector participation in enhancing port development, shipping operations, vessel traffic and security on a regional scale.

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Reza Zahedi, Ghafourian, Y Zaman, Sh Khoramnejhadian** and **R Dabbagh

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Study of carbon dioxide and methane adsorption on carbon molecular sieves, raw and modified by waste engine oil

In this study, a carbon molecular sieve (CMS) was synthesized from walnut shells, followed by physical activation of the carbon content of the CMS. Adsorption of CO2 and CH4 onto raw and acid treated adsorbents was investigated using two sizes, 300–600 and 600–1180µm.The adsorbents were impregnated with two solvent mixtures of waste engine oil with kerosene and with thinner at a proportion of 1:1 at 25 °C. The highest adsorption for CO2 and CH4 was obtained at the suitable size of a group of CMS (A) adsorbents, with acid treated adsorbents being more efficient than the raw adsorbents. The acid treated CMS (A-3) sample adsorbed 0.925 mmol CO2 g-1 and 0.353 mmol CH4 g-1. The results indicated that by decreasing the granulation size of group CMS(R) adsorbents, the adsorption capacities for CO2 and CH4 were reduced while increasing the granulation size of group CMS (A) adsorbents resulted in an enhancement in the adsorption capacity for CO2 and CH4. Moreover, acid treated adsorbents achieved enhanced adsorption capacity for CO2 and CH4. Further modifications reduced the adsorption capacity for CO2 and CH4 in impregnated adsorbents, due to a decrease in surface area, pore volume and pore size of the adsorbent.

Biography

Reza Zahedi, was 48 years old. He received his PhD in Pollution Environment from Department of Environment, Damavand branch, Islamic Azad University, Damavand, Iran on the November 1 2020. His thesis title is "Preparation of Modified Carbon Molecular Sieve by Used Oil for Separating Carbon Dioxide and Methane" and he has written 3 papers related to my thesis. He has been teaching HSE and ISO 14001 and ISO 45001 and waste management for industrial and service units for about 10 years. His research interests are the remove and adsorption of air and water pollution. He is the managing director and owner of magazine Environment and Tourism in Persian language.

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Majida Mcheik

The Lebanese Ministry of Agriculture, Lebanon

Reuse of Treated Municipal Waste Water in Irrigation: A Case Study from Lebanon and Jordan

In this study, we present the results of scenarios where secondary-treated municipal wastewater was used for table grapes irrigation in the region of Ablah, Bekaa valley in Lebanon, and fodder crops irrigation (vetch and barley) in the region of Ramtha in Jordan. In Lebanon, we carried out experiments to assess the response of drip-irrigated table grapes grown under two water quality regimes (Freshwater (FW) and treated wastewater (TW) and two water levels (100% of evapotranspiration (ETc) and 75% of ETc). While in Jordan, we carried out experiments to assess the response of drip irrigated fodder crops considering 4 irrigation levels (Q1: Rain fed; Q2: 80% of ETc; Q3: 100% of ETc; Q4: 120% of ETc) and three crop patterns (C1: Barley 100%; C2: Vetch 100%; C3: Mix 50% barley and 50% vetch). Based on the production and quality components, table grapes were successfully grown on plots supplied with TW. Fodder crops were successfully grown using TW with remarkable increase in biomass and grain yield production for the irrigated treatments.

Biography

Majida Mcheik obtained a PhD on earth and environmental sciences from University of Naples and Lebanese University and a Masters in Agricultural engineering from Lebanese University. She is currently the head of the program department at the Ministry of Agriculture in Lebanon. And she was a Senior Adviser to the Minister of Agriculture for three years. She was also IFAD governor in Lebanon. And she is the Focal point for Food Security Sector from the Ministry of Agriculture. She is a national coordinator for a number of development projects at the Ministry of Agriculture. She is a Member of the Administrative Board of Lebanese Woman Affair's Association. She has published different studies on the use of treated waste water in irrigated agriculture and plant protection.

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Khaled Rais *and* **Adel Djellali**

Larbi Tebessi University, Algeria

Analytical study of municipal solid waste (MSW) treatment methods in Algeria

This approach represents an analytical study of municipal solid waste (MSW) treatment methods in Algeria through work on two technical landfills, which one represents large cities with a population of over 4 million Algiers (Hamissi Center), whose daily supply exceeds 4000 tons, and the second in Tebessa a small town in Algeria, where the daily quantity reaches 200 tons of (MSW). The study focused on the technical reasons that prevent the use of sorting techniques used around the world. It has become necessary in view of the continuous increase of this waste which we consider as one of the rich and useful sources of raw and secondary materials in countries around the world, in order to maximize the rate of recovery of mixed household waste which has not undergone any sorting or pre-isolation of their components. As is the case in most developing countries that have not yet adopted this civilized behavior in a generalized and efficient manner, such as Algeria, through the activation of recycling techniques and the reproduction of these raw materials. In a concern of balance between the continuous increase in its demand and the state of exhaustion which threatens these natural resources. The study concluded that there was a need to develop technical sorting systems compatible with the specificity of the components of Algerian household waste.

Biography

Khaled Rais has received the award for the most important experimental research from the Algerian Ministry of Environment for the year 2020 for obtaining two patents from the Algerian National Institute of Industrial Property INAPI, through the design of a technological chain for sorting household waste commensurate with the properties of its components that are affected by the consumer behaviors of the Algerian society, as well as the methods of collecting, transporting and treating. He has also worked on developing methods for the exploitation of organic fertilizer for more than 25 years.

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Irin Sutha

College of Science & Humanities, SRMIST, India

The Challenges of Electronic Waste (E-Waste) Management

Information and telecommunications technology (ICT) and systematic networking has pierced nearly every aspect of modern life. It is positively affecting human life even in the most remote areas of the developing countries. The rapid growth in Information and telecommunications technology has led to an improvement in the capacity of computers. But the products lifetime is decreasing the waste electrical and electronic equipment (e-waste) is increase in the large quantity in annually. Information and telecommunications technology development in most developing countries, particularly in Africa, depends more on second hand or refurbished EEEs most of which are imported without confirmatory testing for functionality. So as a result, large quantities of e-waste are presently being managed in these countries. The challenges facing the developing countries in e-waste management include: an absence of infrastructure for appropriate waste management, an absence of legislation dealing specifically with e-waste, an absence of any framework for end-of-life (EoL) product take-back or implementation of Extended Producer Responsibility (EPR).

Biography

Irin Sutha is having 24 years of experience in teaching and working as an Assistant Professor in SRM Institute of Technology since 2010. She is having work experience in St. Mary's Degree College, Yousufguda, Hyderabad and Villa Marie Degree College for Women, Somajiguda, and Hyderabad. Her Awarded PhD in Retail Management in the year 2014. She has published more than 57 articles in SCOPUS indexed journals and other reputed Journals. She has organized more than 10 conferences, Seminars and workshops. She presented more than 45 papers in National and International conferences. Working with two text books titled Performance Management and Retail Management. She acted as a Convenor and Editor for International Conference on Business Research and Business Finance in SRM IST Recognized as a Research Supervisor in the Department of Commerce, SRM IST and guiding scholars for their PhD works. She is the Member of Board of Studies in SRM as well as other universities. She is acting as an Editorial Board member in various Journals. She also is acting as a Reviewer for Journals Acting consultant on various companies for HR and Accounting. She is Passionate in Learning and Teaching.

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