Reference to Class A of Schedule II of Hazardous Waste (Management, Handling & Transboundary Movement) Rules of India

Metal Pollution in Ecosystems.

Ecotoxicology Studies and Risk Assessment in the Marine Environment

Abstract

Metals are considered as important toxic pollutants and there is extensive literature concerning their accumulation in ecosystems. Metals are continuously released into the biosphere by volcanoes, natural weathering of rocks but also by numerous anthropogenic acitivities, such as mining, combustion of fuels, industrial and urban sewage and agricultural practices. On a global scale there is now abundant evidence that anthropogenic activities have polluted the environment with heavy metals from the poles to the tropics and from the mountains to the depths of the oceans.

In this review the recent studies on metal pollution in marine, freshwater and terrestrial ecosystems and their organisms will be presented. Also, metal speciation, bioacummulation in biota, as well as abiotic and biotic factors affecting their bioavailability will be reviewed, as well as the use of bioindicator organisms for the biomonitoring of metals in the environment and the related toxicity mechanisms and ecological effects of heavy metal pollution.

Reference: Science advances on Environment, Toxicology & Ecotoxicology issues
Source link: Science advances on Environment

Ag, Hg and Cr Precipitation for Recycling Derived of Hazardous Liquid Waste

Abstract

Production of different compounds can generate large amounts of hazardous wastes which are dangerous to the envi-ronment and human health. The disposal or treatment of hazardous liquid waste rich in heavy metals like silver (Ag), mercury (Hg) and chromium (Cr) is difficult due to the strong acidity and toxicity which usually present in these con- taminants. For this study, several research works were reviewed in order to obtain an efficient and viable treatment in time and removal efficiency. A series of chemical precipitations were evaluated for efficiency in the reduction of heavy metals in liquid waste. The precipitation of all three metals lasted 30 minutes and after treatment the wastewater pre-sented concentrations of 0.064 mg·L−1 Ag, 0.010 mg·L−1 Hg and 0.048 mg·L−1 Cr, with a standard pH (7.5 - 8.5); with removal efficiencies of 94.31% for Ag, 99.99% for Hg and 98.17% for Cr.

Reference: Green and Sustainable Chemistry, 2013, V-3, 37-42
Source link: Green and Sustainable Chemistry

Changes In Some Biophysical And Biochemical Parameters In Blood And Urine Of Worker Chronically Exposed To Benzene

Abstract

Objective: Benzene may occur naturally as a component of petroleum, or may be manufactured synthetically. It is found in the environment as a contaminant from both human activities and natural processes, posing serious bio-hazards from chronic exposure.

Methods: A total of 330 individual were enrolled to study possible health hazards of benzene contamination; 265 males occupationally chronically exposed to low levels of benzene in their daily activity were compared to 65 healthy individuals of the same socio-economic standard. Benzene workers were divided between 45 workers in printing shops, 70 subjects dealing with benzene containing paints (painters), 75 subjects working in professions related to automotive work (autoworkers) and 75 car drivers.

Results: benzene itself was not detected in blood or urine of all participants, but the levels of its metabolites; phenol and t,t-muconic acid, were higher in the blood and urine samples in the group of benzene-exposed workers. The results also indicate that individuals in this group are under oxidative stress. However, neither the determined liver function nor the kidney function tests showed significant deviation from controls. However, the results of the biophysical hematological parameters, including the degree of hemolysis, blood viscosity, RBCs aggregation and form factor were significantly deviated from normal.

Reference: European Scientific Journal August 2013 edition vol.9, No.24 ISSN: 1857 – 7881
Source link: European Scientific Journal

Effect of Mercury Pollution on the Urban Environment and Human Health

Abstract

As developing countries to become industrialized and urbanized, heavy metal pollution is likely to reach disturbing levels. These countries should learn from the mistakes of the developed nations and recognize that rapid deterioration of the environment can occur. There is a lack of data on the nature and extent of metal pollution either at local and regional level, particularly to assist in the understanding of metal cycling in the environment. Although most countries recognize the need to combat pollution, environmental, controls are either nonexistence or inadequate. So in this article we emphasized on one of the most important environment pollutant (Hg) and effect of mercury on the human health and at the end of the article some important and easy ways for preventing mercury hazards will be recommended.

Reference: Environment and Ecology Research 1(1): 12-20, 2013
Source link: Environment and Ecology Research

Effect of Toxic Metals on Human Health

Abstract

Metal ions such as iron and copper are among the key nutrients that must be provided by dietary sources. In developing countries, there is an enormous contribution of human activities to the release of toxic chemicals, metals and metalloids into the atmosphere. These toxic metals are accumulated in the dietary articles of man. Numerous foodstuffs have been evaluated for their contributions to the recommended daily allowance both to guide for satisfactory intake and also to prevent over exposure. Further, food chain polluted with toxic metals and metalloids is an important route of human exposure and may cause several dangerous effects on human. In this review we summarized effects of various toxic metals on human health.

Reference: The Open Nutraceuticals Journal, 2010, V-3, 94-99
Source link: Environment and Ecology Research

Environmental Impact Assessment of Tanneries: A Case Study of Hazaribag in Bangladesh

Abstract

From the very beginning of industrialization in Bangladesh, tanning industries have been playing a significant role in the country's economy. Due to its importance as a labor based export oriented industry the full flourish of this industrial sector is essential. But due to the absence of proper waste management, using inferior technologies, lack of facilities for treating industrial wastes; the tanning industries especially located in Hazaribag, Dhaka are aggravating environmental problems day by day. The discharging and dumping of wastes near the water bodies without treatment makes it almost look a like an area which is lying under the blanket of pollution. It is an emerging problem not only for the environment but also as the social context of the country. This study focuses on the tanneries of Hazaribag located in Dhaka to assess the present situation arising from such activities and proposed several mitigation measures. This was done by analyzing the affects of various chemicals over human health and the surrounding environment. An Environment Impact Assessment (EIA) was undertaken for assessing several physical, ecological, human use and socio-economic parameters of the surrounding environment of the area.

Reference: International Journal of Environmental Science and Development, Vol. 3, No. 2, April 2012
Source link: International Journal of Environmental Science and Development

Heavy Metal Pollution in China: Origin, Pattern and Control

Abstract

Goal, Scope and Background: Heavy metal is among one of the pollutants, which cause severe threats to humans and the environment in China. The aim of the present review is to make information on the source of heavy metal pollution, distribution of heavy metals in the environment, and measures of pollution control accessible internationally, which are mostly published in Chinese.

Methods: Information from scientific journals, university journals and governmental releases are compiled focusing mainly on Cd, Cu, Pb and Zn. Partly M, As, Cr, Fe, Hg, Mn and Ni are included also in part as well.

Results and Discussion: In soil, the average contents of Cd, Cu, Pb and Zn are 0.097, 22.6, 26.0 and 74.2 mg/kg, respectively. In the water of the Yangtze River Basin, the concentrations of Cd, Cu, Pb and Zn are 0.080, 7.91, 15.7 and 18.7 μg/L, respectively. In reference to human activities, the heavy metal pollution comes from three sources: industrial emission, wastewater and solid waste. The environment such as soil, water and air were polluted by heavy metals in some cases. The contents of Cd, Cu, Pb and Zn even reach 3.16, 99.3, 84.1 and 147 mg/kg, respectively, in the soils of a waste water irrigation zone. These contaminants pollute drinking water and food, and threaten human health. Some diseases resulting from pollution of geological and environmental origin, were observed with long-term
and non-reversible effects.

Conclusions: In China, the geological background level of heavy metal is low, but with the activity of humans, soil, water, air, and plants are polluted by heavy metals in some cases and even affect human health through the food chain.

Recommendations and Outlook: To remediate and improve environmental quality is a long strategy for the polluted area to keep humans and animals healthy. Phytoremediation would be an effective technique to remediate the heavy metal pollutions.

Reference: A State-of-the-Art Report with Special Reference to Literature Published in Chinese Journals
Source link: Heavy Metal Pollution in China

Human Health Concerns of Lead, Mercury, Cadmium and Arsenic

Abstract

The trace elements lead, mercury, cadmium and arsenic have caused major human health problems in several parts of the world. Concern over such incidents has prompted numerous investigations into the metabolism and toxic effects of these four elements. This chapter outlines their contrasting metabolism and describes the major health effects and the relative scale of such incidents. Attention is paid to the environmentally important chemical species of mercury and arsenic, the overall health significance of early biochemical effects and the limitations of certain epidemiological studies. Comparisons are made between the exposure threshold for the initial effects of each element and the exposure levels seen in the general population.

Reference: A Lead, Mercury, Cadmium and Arsenic in the Environment
Source link: Journal of Archives of Toxicology

Human health risk assessment of air emissions from development of unconventional natural gas resources

Abstract

Background: Technological advances (e.g. directional drilling, hydraulic fracturing), have led to increases in unconventional natural gas development (NGD), raising questions about health impacts.

Objectives: We estimated health risks for exposures to air emissions from a NGD project in Garfield County, Colorado with the objective of supporting risk prevention recommendations in a health impact assessment (HIA).

Methods: We used EPA guidance to estimate chronic and subchronic non-cancer hazard indices and cancer risks from exposure to hydrocarbons for two populations: (1) residents living >½ mile from wells and (2) residents living ≤½ mile from wells.

Results: Residents living ≤½ mile from wells are at greater risk for health effects from NGD than are residents living >½ mile from wells. Subchronic exposures to air pollutants during well completion activities present the greatest potential for health effects. The subchronic non-cancer hazard index (HI) of 5 for residents ≤½ mile from wells was driven primarily by exposure to trimethylbenzenes, xylenes, and aliphatic hydrocarbons. Chronic HIs were 1 and 0.4. for residents ≤½ mile from wells and >½ mile from wells, respectively. Cumulative cancer risks were 10 in a million and 6 in a million for residents living ≤½ mile and >½ mile from wells, respectively, with benzene as the major contributor to the risk.

Conclusions: Risk assessment can be used in HIAs to direct health risk prevention strategies. Risk management approaches should focus on reducing exposures to emissions during well completions. These preliminary results indicate that health effects resulting from air emissions during unconventional NGD warrant further study. Prospective studies should focus on health effects associated with air pollution.

Reference: Science of the Total Environment
Source link: SciVerse ScienceDirect

Textile dyeing industry an environmental hazard

Abstract

Color is the main attraction of any fabric. No mat- ter how excellent its constitution, if unsuitably colored it is bound to be a failure as a commercial fabric. Manufacture and use of synthetic dyes for fabric dyeing has therefore become a massive industry today. In fact the art of applying color to fabric has been known to mankind since 3500 BC. WH Perkins in 1856

discovered the use of syn- thetic dyes. Synthetic dyes have provided a wide range of colorfast, bright hues. However their toxic nature has become a cause of grave con- cern to environmentalists. Use of synthetic dyes has an adverse effect on all forms of life. Pres- ence of sulphur, naphthol, vat dyes, nitrates, ac- etic acid, soaps, enzymes chromium compounds and heavy metals like copper, arsenic, lead, cad- mium, mercury, nickel, and cobalt and certain auxiliary chemicals all collectively make the te- xtile effluent highly toxic. Other harmful chem- icals present in the water may be formaldehyde based dye fixing agents, chlorinated stain remo- vers, hydro carbon based softeners, non bio deg- radable dyeing chemicals. These organic mate- rials react with many disinfectants especially chl- orine and form by products (DBP'S) that are often carcinogenic and therefore undesirable. Many of these show allergic reactions. The colloidal mat-ter present along with colors and oily scum in-creases the turbidity, gives the water a bad ap-pearance and foul smell and prevents the pene-tration of sunlight necessary for the process of photosynthesis. This in turn interferes with the Oxygen transfer mechanism at air water interface which in turn interferes with marine life and self purification process of water. This effluent if al-lowed to flow in the fields' clogs the pores of the soil resulting in loss of soil productivity. If allowed to flow in drains and rivers it effects the quality of drinking water in hand pumps making it unfit for human consumption. It is important to remove these pollutants from the waste waters before their final disposal.

Reference: Natural Science Vol.4, No.1, 22-26 (2012)
Source link: Natural Science

Toxic Metal Contamination on the River near Industrial Area of Dhaka

Abstract

The present study investigates the anthropogenic metal input in to the river system, the toxic metal contamination in the sediment of the river and evaluates the dissolution of metal from soil to surface water or leaching through soil profile. Nine sampling stations along the river channel and three in the industrial canals are chosen and a set of surface water and sediment samples from each station were collected. Samples are analyzed for Fe, Mn, Cu, Cr, Pb, Ni, Cd, As and Zn by Atomic Absorption Spectrophotometer (AAS). The findings show that, toxic metals content among all the samples are distributed in a decreasing sequence of Fe>Mn>Zn>Ni>Cu>Cr>As>Pb>Cd. The content of the most toxic metals in wastewater and sediments of the industrial canals are much higher than that of river water and sediments. Moreover, most of the toxic metal contents are found to exceed the background concentration in all sediment samples. Higher geo accumulation values are observed for Zn, Ni and Cu probably due to the anthropogenic metal supply with uncontrolled discharge of industrial effluents into the river. Further, higher enrichment factors are found for Zn, Ni and Cu suggesting also anthropogenic source of metals. Significant correlation is also observed among these, indicating the same source of occurrence. Partition coefficient, Kd values are found in the order: Ni>Zn>Cr>Cu>Pb and lower Kd values are found in the sediments near industrial area indicating much leaching or dissolution. Therefore, it can be concluded that sediments of the river close to industrial area is contaminated by toxic metals which enter into the food stuff and give rise to various health hazards of the inhabitants.

Reference: Universal Journal of Environmental Research and Technology, Volume 2, Issue 2: 56-64
Source link: Universal Journal of Environmental Research and Technology